IRON TRADE REVIEW AND WESTERN MACHINIST

A JOURNAL OF MANUFACTURES, HARDWARE, METALLURGY AND INVENTION.

VOLUME XIX. CLEVELAND, O., MAY 22, 1886. NUMBER 21.

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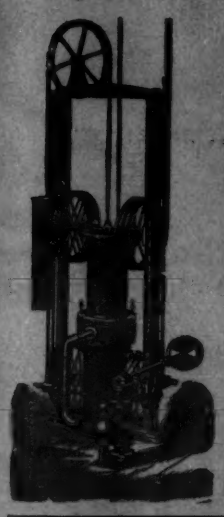

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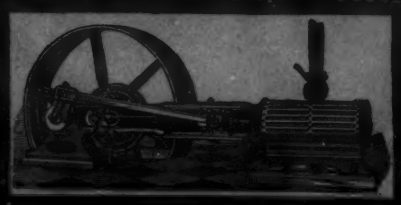

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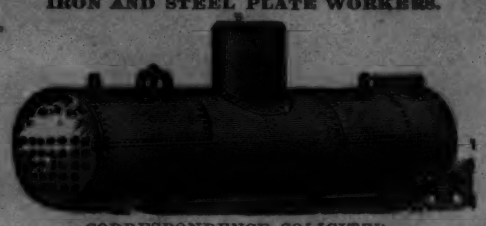

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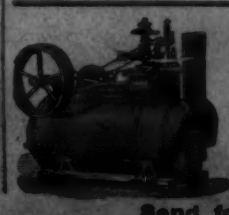

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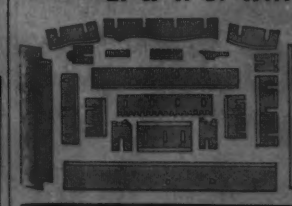

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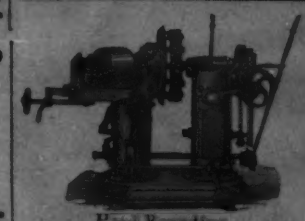

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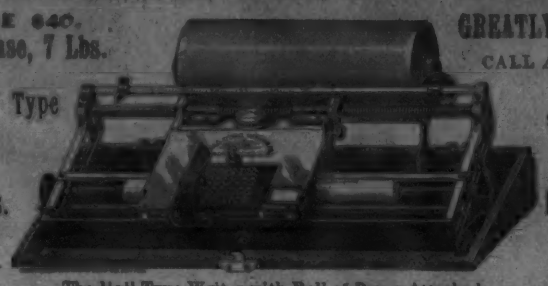

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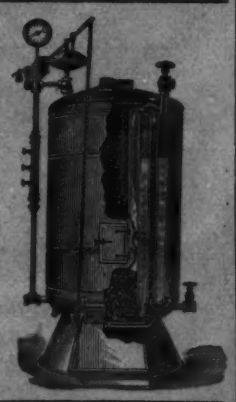

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IRON TRADE REVIEW AND WESTERN MACHINIST

VOLUME XIX. CLEVELAND, O., MAY 22, 1886. NUMBER 21.

DEFECTS IN BOILER PLATES.

The work of corrosion is insidious, whether it is external or internal. A boiler that is set in brick-work may leak at the seams, and corrode the plates adjoining, and yet there may be no indication of danger. So, by the use of impure water, a very dangerous process may be going on inside the boiler. In boilers covered more or less with scale its presence is often detected by red streaks where the scale is cracked. It attacks the edges of plates at the joints, and around the rivet heads. Sometimes it will attack two boilers working side by side. One will be corroded in the front part, and the other in the back part. Sometimes different sheets in the same boiler will be corroded, while others remain intact.

The accompanying cuts show some of the results of corrosion. Figs. 1 and 2 show a portion of the water leg of a steamboat boiler, the condition of which was discovered by inspection. The piece from which the drawings were made can be seen in our office. It is corroded through in spots, as may be seen from the cut, while a large portion of it is as thin as paper. It had been patched, but there was a very insufficient ground work for the patches. This steamboat was used in Summer as an excursion boat, and thousands of people rode over the boilers in the condition shown.

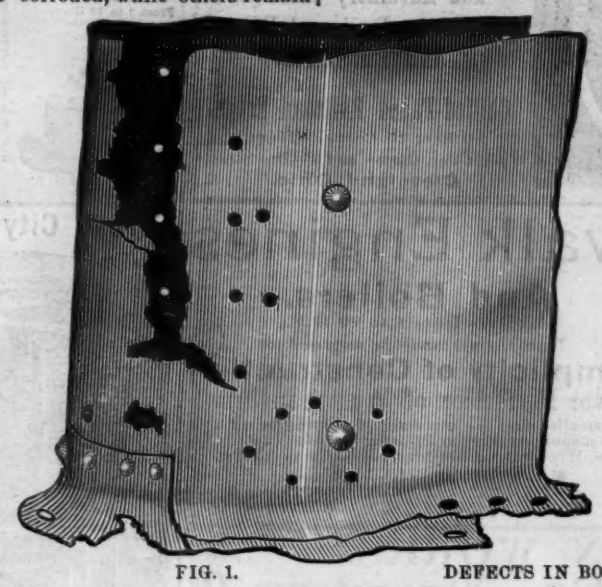


FIG. 1.

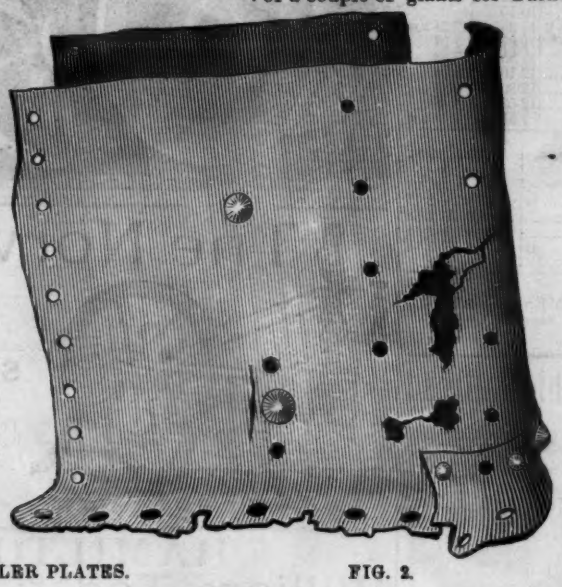
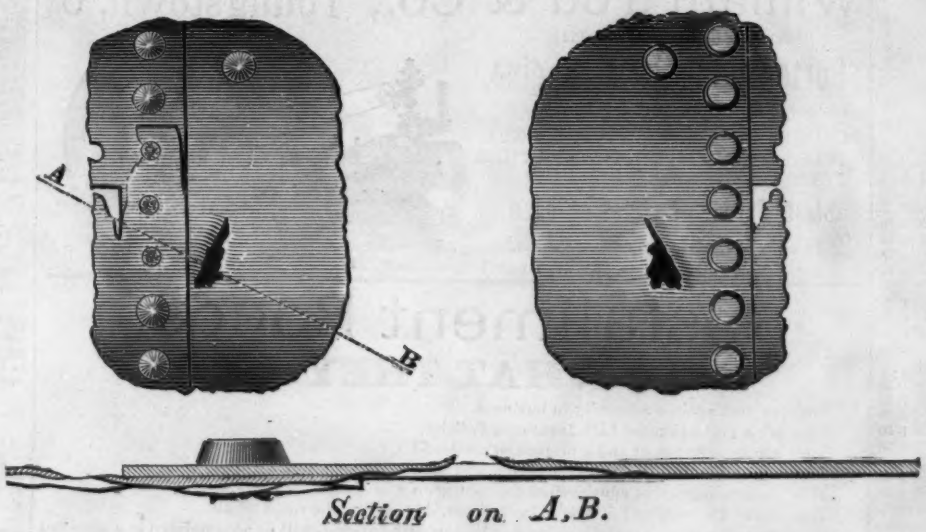


FIG. 2.

DEFECTS IN BOILER PLATES.

Fig. 3 shows another case of corrosion, of a type that is very common. The cut shows both the inner and outer sides of the sheet, and also a cross section. The hole shown was made by the inspector's chisel.



Again, boilers are often found in what is known as a pitted condition. This is manifested by small spots in close contact being eaten into the sheet. It looks like a pock-marked face and is sometimes confluent; and what is strange about this is, that often certain sheets in the boiler will be attacked while others will remain sound, and the iron will bear the same brand on each plate. It is well known that iron ore even from the same mine is not always chemically the same; certain impurities will be found in some places which do not exist in others. And in the manufacture of boiler iron there is no doubt but that the sheets may be chemically slightly different; hence, when the boiler is in operation the presence of water may excite galvanic action. This would account for the manner in which some boilers are affected, while in other cases the cause of the trouble may be easily traced to a different source.

These peculiar cases of pitting are almost wholly confined to localities where the water is not of the best quality. The accompanying Figures 4 and 5 show a portion of the lower head of an upright boiler which was fed with water whose source was in a swamp. Fig. 4 shows the entire piece, and Fig. 5 an enlarged view of the small piece cut out as shown on the lower edge of Fig. 4.

When a weak or corroded spot is found in a boiler, it should be carefully examined with reference to the best means of repairing it. If the sheet is found to be corroded so thin that there is not strength enough to hold the rivets necessary in patching, the sheet should be entirely removed and a new one substituted. Or if the defective spot is confined to only a portion of the sheet, the iron should be cut away until the sound metal is reached, and the patch should be riveted thoroughly to the sound portions of the sheet. Soft patches are not to be recommended in any portion of a boiler, and should only be allowed in exceptional cases, and on those portions of a boiler remote from the fire.

Figures 6, 7, and 8 show what may happen when soft patches are allowed. The rectangular piece is a patch, the thickness being one-fourth of an inch. The drawings are made to scale from the specimen now in our office. From an examination of Fig. 8, a very clear idea may be gained of the very small thickness of metal left in the sheet to which the patch was bolted. It is difficult to express the character of such work, and yet it is done every day.—[The Locomotive.

IN the first four months of 1886, according to the *Railway Age*, 666½ miles of new railway were built in this country, which is about twice as much as was built in the same period of 1885. The principal activity thus far appears to be in Texas, Wisconsin, Illinois, Florida, and Kansas.

STEEL GUNS.

Manufacturers' Gazette, Boston.

The economy of iron guns has been demonstrated not only in their first cost, but in their ability to stand all the strain that the steel will hold, besides being cast with more assurance of accuracy and uniformity of temperature. But steel is the fashion, and so here in America we have been predetermined to go headlong into the brittle stuff, notwithstanding that in Boston our makers have been giving the Government a propelling machine that will hold all the charge they can ram home, and repeat its work with precision and accuracy. The interest that Krupp secured in the trial he made of a couple of giants for Turkey, almost led our people to beg of him duplicates, but better counsel prevailed, and wisely too, for now the administration is advised that notwithstanding Krupp's denial in the London *Times* of the rumored failure of his pets, the fact is that they have failed, and Mr. Krupp knew he was prevaricating when he addressed the watching people of the world. But here are the facts, sent to the editor of the IRON TRADE REVIEW by C. H. Heap, consul-general of this nation at Constantinople. * * * * We do not forget that the Senate commission who reported early in the Winter in favor of the Americans developing their own plant for the casting, boring and mounting of guns was tabooed by some of the leading newspapers, who belabored the report for this enthusiasm, decrying our inexperience and bewailing the tremendous cost to occur in starting this steel-gun business here, and insisting that, as Krupp had his hand in, all the plant built, and furnished the shooting irons for all potentates, expedition and economy would be served by going with our desires and money to Germany. This practical demonstratien of the latest and best by Krupp will explode that nonsense, and possibly now nerve Congress to take up this important anxiety of coast defence and navy equipment with patriotic confidence in the sons of its own people.

THE Standard Oil Company charges for natural gas, per month, at Bradford, $6.25; at Olean, $4.50; at Warren, $4; at Jamestown, $3.50; at Titusville, $2; at Oil City, 50 cents, and at Meadville, 50 cents, for the like service. These towns are all grouped within a short distance of the gas supply. The prices charged are a very pretty illustration of the rule which fixes the cost of service by what the traffic will bear.

TURNINGS from steel-tired wheels are being preserved by Mr. Adams, of the B. & A., with a view to the future determination of the relationship between mileage and chemical constituency.

Engineers Don't be Deceived. The Cyclone Steam Flue Cleaner is the only Cleaner made giving steam a spiral motion the entire length of the tubes.
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WHEELING & LAKE ERIE

TIME TABLE—IN EFFECT JAN. 18, 1886.

Central Standard Time

EASTWARD.	No. 5.	No. 7.	No. 9.*	No. 1.*
Toledo.....lv	7 45 AM	12 30 PM	5 00 PM	.....
Oak Harbor...ar	8 43	1 22	5 55	.....
Fremont.....	9 07	1 47	6 18	.....
Clyde.....	9 23	2 03	6 33	.....
Bellevue	9 38	2 18	6 47	.....
Monroeville ..lv	9 57	2 32	7 03	1 35 AM
Norwalk	10 13	3 00	7 20	1 50
Wellington	11 03	3 52	9 00	2 32
Creston.....ar	11 52	4 40	10 45 PM	3 15
Orrville.....ar	12 20	5 10	11 45	3 45 *
Orrville.....lv	12 40 PM	5 10	6 00 AM	6 00 AM
Massillon.....ar	1 20	5 50	6 40	.....
Massillon.....lv	1 20	5 50	6 40	.....
Valley Junc.lv.	2 10	6 50	7 30	7 30
Sherrodsville...	2 40	7 20 PM	8 30	8 30
Canal Dover.....	2 38 PM	.....	5 00	.....
New Comerst'n	3 27	.....	8 47	.....
Cambridge.....	4 30	.....	9 45	.....
Macksburg	6 10	.....	11 38	.....
Marietta.....ar	7 20 PM	.....	12 50 PM	.....

WESTWARD.	No. 6.	No. 8		
Marietta lv	6 20 AM	2 30 PM	.....	.....
Macksburg	7 25	3 42	.....	.....
Cambridge.....	8 54	5 20	.....	.....
New Comerst'n	9 48	6 20	.....	.....
Canal Dover.....	10 28	6 55	No. 4.	No. 2.*
Sherrodsville...	10 15	5 00	6 45 AM	
New Cumberl'd	10 35	5 35	7 00	
Valley Junc.....	11 15	7 45	7 25	
Massillon.....	12 30 PM	8 35	8 12	
Orrville.....ar	1 10	9 15 *	8 50	
Orrville.....lv	1 25	10 15	8 50	
Creston..... lv	1 57	10 45	9 22	
Wellington	2 45	11 28	10 10	
Norwalk.....	3 35	12 10 AM	11 25	7 25 AM
Monroeville	3 47	12 25 *	11 37	7 37
Bellevue.....	4 04	.....	11 55	7 53
Clyde	4 18	.....	12 10 PM	8 08
Fremont.....	4 35	.....	12 30	8 25
Oak Harbor.....	4 58	.....	12 55	8 48
Toledo .....ar	5 55 PM	.....	1 55 PM	9 45 AM

29.	27.	Norwalk & Huron.		26.	28.
P. M.	A. M.			A. M.	P. M.
6 00	11 45	.....ar..... Huron.....lv	.....	6 25	2 15
5 47	11 25	.....Fries Landing.....	.....	6 38	2 28
5 35	11 10	.....Milan.....	.....	6 52	2 45
5 15	10 45	.....lv...Norwalk.....ar	.....	7 15	3 10

* Daily.

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No. 72, New York Express.....	* 8 25 a m
No. 72, Fast Pittsburgh Express	* 8 25 a m
No. 64, Fast New York Express.....	* 3 00 p m
No. 64, Pittsburgh Express.....	* 3 00 p m
No. 66, Mahoning Valley Accommo	* 4 25 p m
No. 68, New York Express.....	†11 10 p m
No. 68, Pittsburgh Express.....	†11 10 p m
No. 88, Leavittsburg Local	*12 25 p m
	Arrive.
No. 63, New York Express...	* 6 35 p m
No. 63, Pittsburgh Express, ...	* 6 35 p m
No. 65, Fast New York Express.....	*10 50 a m
No. 67, Pittsburgh Express.....	* 1 30 p m
No. 61, New York Express.....	† 6 10 a m
No. 61, Pittsburgh Express.....	† 6 10 a m
No. 69, Pittsburgh Local Express	†10 40 p m
No. 77, Mahoning Valley Accommo	† 8 00 a m

* Daily. † Daily, except Sunday.

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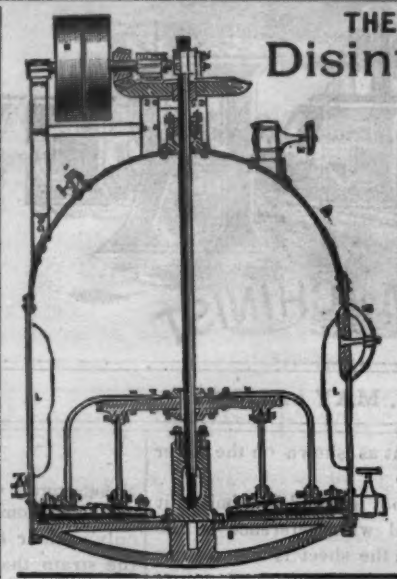

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Disintegrating Machine.
The Only Method for Preparing the Ore for Amalgamation.

Disintegrating, Decomposing and Desulphurising the ore under a HIGH TEMPERATURE and PRESSURE OF STEAM HEAT, with chemical action and attrition, dissolves and breaks up the chemical combination in the ores, individualizing, cleansing and separating the atoms of metal from the gangue, perfectly freeing them for amalgamation in combination with the MEECH AMALGAMATION MACHINE and process, (being the greatest combination of Amalgamation known), will successfully extract 90 per cent. of the metal from rebellious ores, such as Sulphurets, Sulphates, Sulphides, Chlorides, Bromides, Oxides, Tellurides, &c.

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MEECH & CO., Cleveland, O.

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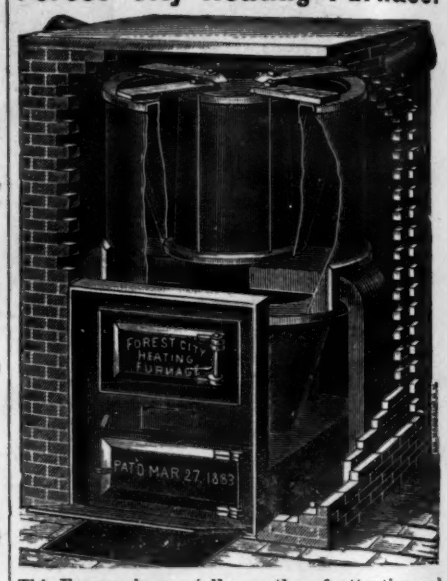
Forest City Heating Furnace.



This Furnace is especially worthy of attention and examination on account of its originality, being
Based upon a New Plan.
It is so constructed that it is impossible for it to smoke or leak gas; and has a dust damper so arranged that no dust can arise when dumping or shaking the grate; which every housewife must admit to be an item of great importance. Another great feature is its great economy in the consumption of fuel; and yet it is the most powerful heater in the market, and has never failed to give perfect satisfaction. Read the following and see what a user says of its merits:

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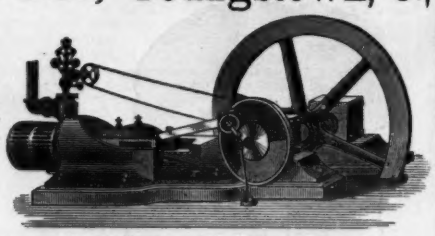

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The Company, should the purchaser be unable to pay the Installments coming due, will advance the amount desired and continue the Bond in force.

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The Bond affords the very best security, and is negotiable the same as any other bond or stock.

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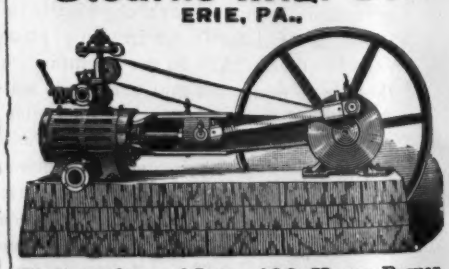

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Foundry Practice

PRACTICAL STUDIES IN MOULDING.

By Thomas D. West, Author of "American Foundry Practice."

SECOND PAPER.

Written for the IRON TRADE REVIEW.

In the last paper was discussed the question of holes in castings, caused through ill-feeding and gas. We will now discuss the subject of holes caused by the metal's "sullage," and what relation the "skimming gate" bears to the production of clean castings.

An impression which prevails among many with respect to "skimming gates" is that the "sullage," or dirt which they are intended to prevent getting into a casting, comes from the iron's own elements. There is, generally speaking, no dirt in liquid iron. The dirt which is generated, and is desired to be kept from entering a mould, comes from the surface of metal, and the surface washings of sand from pouring basins, runners and gates. The "sullage," or dirt, which comes upon the surface of liquid iron, when a ladle is skimmed off, with the exception of slag, which may melt off from the sides of dirty ladles, is chiefly due to the affinity iron has for the oxygen of the air. This scum, which occurs from the oxidation of the metal's surface, will, as long as the metal's surface is exposed to the atmosphere, whether in the ladle, or on its passage through basins and runners to the mould, be created. This scum, combined with the dust and washed sand of the pouring basin, runner and gates, of which there is always more or less bound to be created by the friction of flowing metal, is what requires to be arrested and held from going into the mould.

As to what percentage of the above sullage, or dirt, "skimming gates" will arrest and hold from passing into a mould depends largely upon the moulder's skill and judgment in making them. Some can construct a skimming gate so that little or no dirt will escape them or pass into a mould. One great mistake many moulders make in the construction of skimming gates, is that of using one system for both light and heavy work. One special system of skimming gates cannot be practically applied to all grades of castings. The heavy castings must have a system of skimming gates which will admit of their delivering metal to the mould with such rapidity as to not take over a few seconds longer to fill a mould whose casting would weigh ten tons, than did it weigh but 200 pounds. The conditions which are to be thus met and overcome, with reference to surety in arresting sullage and dirt from passing into a mould, are far more favorable with light than heavy work, from the fact that gates which deliver the metal to light work moulds can be, and are as a general thing, made very small in comparison to heavy work gates; and when it is taken into consideration that the smaller the gates, the less chance there is for dirt to pass through them, it becomes evident that light work, as far as skimming gates are concerned, has greatly the advantage over heavy work, in aiding to make clean castings.

While it is true that small work has the advantage over large, in getting castings clean, yet there is much unclean work with large castings that could be easily avoided, were there better judgment used in making skimming gates.

One great error to be found practiced in skim-gating small castings is that of cutting the gate which joins the mould, in a thick, bulky manner, instead of having the same area spread out in a thin, broad gate. Of course, there is work that will not admit of the "inlet gate" being cut thin and broad, but nevertheless there is a great deal of work that could be run with broad, thin gates, that is not.

With inlet gates made broad and thin, and no larger than what will insure the pouring runner being kept full, and using "hot iron," with the ladle well skimmed, the labor of making skimming gates may often be avoided in procuring clean small castings, and in fact, with castings under 100 lbs. weight, better results can be obtained by many moulders by adopting the above plan, than were they to try and accomplish the same end by means of cutting skimming gates, simply because they do not understand the principles involved to insure effective results; and when they attempt to make a skimming gate, they are only adding a lot of corners and gate surface, from which the friction of the flowing metal can wash off dust and sand, to become mingled with the metal, as it runs into the mould.

The difference which should exist between light and heavy work skimming gates, and also the principles involved for insuring effective results, will be discussed in the next paper.

[The first of these papers was published in our issue of May 1; back numbers may be had by applying to the publishers.]

DEFECTS IN BOILER PLATES.—FIG. 4.

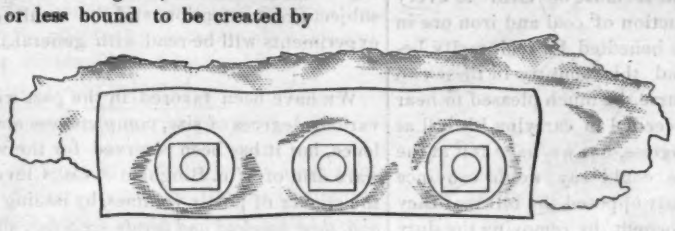

FIG. 6.

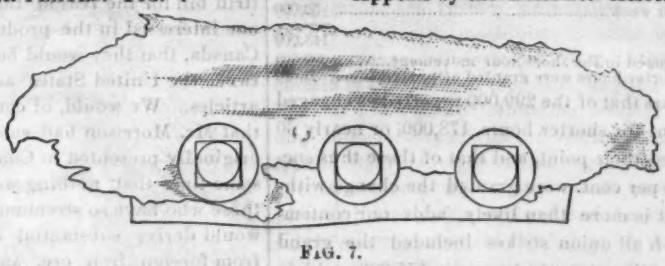

FIG. 7.

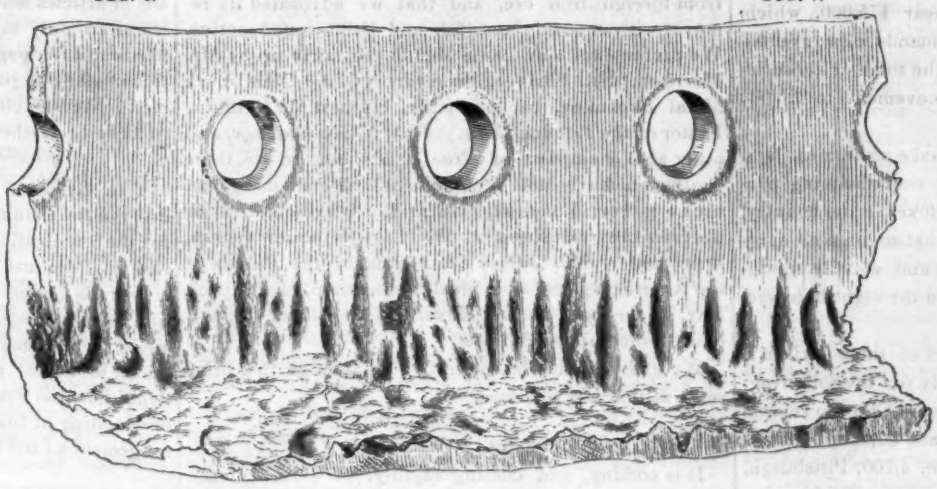

FIG. 5.

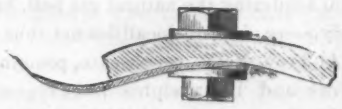

FIG. 8.

THE BASIC STEEL LITIGATION.

To a reporter of the Pittsburgh *Commercial Gazette*, Mr. Jacob Reese, who has just been declared the prior inventor of the Basic steel process, told an interesting story of the litigation had over this important patent, from which we extract the following:

"My real opponent in the suit was the Bessemer Company, Limited, a corporation with a capital of $33,000,000 back of it. Its principal office is in Philadelphia, and Andrew Carnegie, of this city, is one of the Directors. The Vulcan Iron Works, of St. Louis, Joliet Iron Works, of Illinois, Pennsylvania Steel Works, Cambria Iron Works, and six other large concerns of the United States, form the company.

"I invented this process in 1867, if I remember aright. It has been in litigation since 1879. How did it commence? Well, I will tell you. In 1878 or 1879 Andrew Carnegie was on his famous coaching tour in England. While there he attended a meeting of the Iron and Steel Association of London. A paper was read by S. G. Thomas on the basic process. Upon his return to America, Mr. Carnegie induced the Bessemer Association, Limited, to purchase Thomas', Riley's and Snelus' alleged rights to the basic process for this country. Previous to this, however, the Bessemer Association, Limited, had purchased, subject to a royalty of 5 cents per ton, to an amount not to exceed $10,000 per annum, five patents and four inventions from me. This contract was to run during the life of any of the patents or inventions transferred. The consideration, together with the bonus paid down, and an amount to be advanced for legal expenses in procuring patents on the four inventions, or improvements sold them, would amount to about $200,000. After finding that I claimed to be the inventor of the basic process, and after the decision in the first case was given establishing my rights, the Bessemer Association refused to pay me any royalties, or advance any money to prosecute my patent applications, and they have ever since contested my claims in the Patent Office.

"My first contest was for a basic process of dephosphorizing ingot iron and steel. This case was decided in my favor in 1881. The present case was a contest for the basic lime lining for the converter or open hearth in which the basic process is carried into effect. The history of this case is that I filed an application originally, which was put in interference with a patent of S. G. Thomas, owned by the Bessemer Association, Limited. It was tried first before the Examiner of Interferences, and was decided in my favor. An appeal was taken to the Board of Appeals by the Bessemer Association, Limited. The Board split their decision, two members deciding in favor of the Bessemer Association, Limited, and one member deciding for me. Another appeal was taken to the Commissioner in person by me, resulting in an award of priority in my favor.

"The effect of the decision granting me priority is to make the Bessemer Association, Limited, lose on the $275,000 they paid for the Thomas patents. The perfection of the basic process has required years of my time, and in connection with its defence has cost me over $50,000."

Beer Rather Than an Advance.

Akron (O.) Beacon.

When F. S. Haas, an iron founder at Williamsburg, N. Y., granted an increase of 10 per cent. asked for by his men a short time ago, he told them that he could not afford to have them lose from five to ten minutes drinking beer, and appealed to the iron-workers' union. The union replied that it did not favor beer drinking and accordingly a notice went up in the foundry that beer would not be allowed about the establishment. Yesterday the men voluntarily surrendered their 10 per cent. advance and asked for the restoration of their beer, and the request was granted. Beer was once thought to be a strength and stay to manual workers, and the pitcher of beer stood almost at the laborer's elbow in many a shop. But it is now a pretty well established fact that not only do the beer drinkers receive no reinforcement of energy, from their frequent draughts, but their powers of endurance are, on the contrary, rather impaired by the habit. Here are men who give up an advance, readily granted, that they may have opportunity to spend part of their lessened pay in crippling their earning power!

Drilling Iron and Steel.

For turning and drilling wrought iron and steel, one ounce of a mixture of soft soap, with half its weight of pearl-ash in about one gallon of boiling water, is in every-day use in most engineering shops. The work, though constantly moist, does not rust.

IRON TRADE REVIEW
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ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER.

CLEVELAND, O., MAY 22, 1886.

THE EIGHT-HOUR DEMAND.

Theorizing as to the justice or injustice of the demand for eight hours as a day's labor seems superfluous in the face of figures presented by *Bradstreet's* of last week. Summarizing the results of its inquiries, made since the 1st inst., we have the following:

Total reported striking for shorter hours	150,000
Total reported last week	6,000
	156,000
Total securing shorter hours without striking	111,000
Total reported last week	32,000
	143,000
Total number engaged in the short-hour movement	299,000
Total to whom shorter hours were granted after striking	35,000

It thus appears that of the 299,000 reported as engaged in the movement for shorter hours, 178,000, or nearly 60 per cent., carried their point, and that of those thus successful, over 80 per cent. were granted the change without striking. It is more than likely, adds our contemporary, that with all union strikes included the grand total on strike will prove to be near 175,000, which, with the 150,000 to whom the demands were granted without any strike, will bring up the total of those actively engaged in the short-hour movement to 325,000 workingmen.

While "one swallow does not make a summer," and 325,000 workingmen do not bear an overwhelming proportion to the total number of employes in the country, it is nevertheless a significant fact that so large an army should have joined in this demand, and equally significant that so many have been put on the eight-hour system.

A study of the detailed statistics of these strikes is interesting, but we have room only for the following: Of the 150,000 striking for shorter hours, Chicago reports 50,000; New York, 35,000, Cincinnati, 32,000; Milwaukee, 7,000; Baltimore, 6,000; Boston, 4,700; Pittsburgh, 4,250; Detroit, 3,000; St. Louis, 2,000; Washington, 1,500; Newark, 1,200, and eleven other cities with fewer than 1,000 each. The total number striking among the building trades is 25,000 (Cincinnati, 5,000; Boston, 4,700; Pittsburgh, 3,100, and Washington, 1,500); pattern makers, 30,000 (20,000 New York, Brooklyn and Jersey City, 3,500 Cincinnati, and 5,000 at Chicago); 15,000 furniture-makers (7,000 Chicago and 4,000 Cincinnati); 3,000 cabinet-makers and 3,000 piano-makers (both at New York), and 8,000 laborers (5,000 at Cincinnati).

Since the granting of these demands, the labor market has subsided to somewhat nearer its normal condition, and confidence is in a measure returning.

WEST VIRGINIA COKE.

We have received an interesting letter from Mr. George H. Hull, of Louisville, Ky., in which he says:

We have just been reading with much interest articles in your paper of April 10 and May 1, in relation to the New River, West Virginia, coke. We quote from the article of April 10, as follows: "The coke used was an inferior article, picked up where it could be obtained during the Connellsville strike." The New River coke not being so well known, and being somewhat lighter than the Connellsville, is almost universally looked upon by parties seeing it or using it as inferior to Connellsville, which has been the standard for so many years. It has been tried and condemned by a good many concerns, simply because they considered it inferior, and were afraid to use it as we recommended it—using more of it than they did of Connellsville, and, in consequence, obtained poor results. * * *

Mr. Hull gives recent analyses of five New River coals, which show that they analyze 8-10 to 2 1-10 ash against 8 2-10 ash in Connellsville; also that they analyze from 69 to 79 per cent. of fixed carbon against 59 per cent. in Connellsville. Taking the best analysis of New River coke with the best analysis of Connellsville, we have 93 per cent. of carbon against 89 per cent.; 6 per cent. of ash against 9 per cent., and 3-10 per cent. sulphur against 8-10.

We have no interest to subserve in this matter beyond getting at facts which every foundryman desires to know; and if there is anything to be said on the other side, we would be pleased to hear it.

HERE'S FRANKNESS.

Our excellent contemporary, the *Canadian Mining Review*; is possessed of a degree of frankness which is to be envied in this day of deceit and dissimulation. It would be pleased to see the United States open its markets to Canadian iron ore and coal, for the very simple and obvious reason that such an arrangement would benefit Canada first, last and all the time, and it isn't afraid to say so. At the same time, it doesn't hope much for any substantial aid from the advocates of Free Trade, either in this country or in England. Hear it:

We have refrained from commenting on the Morrison tariff bill for the reason that it must be clear to every one interested in the production of coal and iron ore in Canada, that they would be benefited by reciprocity between the United States and this country in these two articles. We would, of course, be much pleased to hear that Mr. Morrison had succeeded in carrying his bill as originally presented to Congress, but we have felt at the same time that nothing we could say would convince those who have so strenuously opposed the bill that they would derive substantial benefit by removing the duty from foreign iron ore, and that we advocated its removal with a purely unselfish and disinterested motive. We prefer that our cause should be taken up by Mr. Morrison, Mr. Shriver, Secretary of the New York Metal Exchange, backed by Mr. Herbert W. Griffiths, Editor of the London (Eng.) *Iron Trade Exchange*, and other able champions of Free Trade; but, so far, these gentlemen have not been able to befriend us against such a powerful combination as the representatives of the iron ore industries of the Lake Superior region, supported by Mr. James M. Swank, of the *Bulletin* of the American Iron and Steel Association, Mr. Wilson Day, of the IRON TRADE REVIEW (Cleveland, O.), and other red-hot protectionists.

We trust we may be permitted to indulge in a brief smile at that last sentence.

ENTER, FUEL GAS.

It is coming, and coming rapidly. We refer to the era of gaseous fuel. Its use will not be long confined to the horizon bordering the natural gas belt, but will soon reach many more distant localities not thus favored by nature. At Troy, N. Y., we observe, prominent citizens of New York and Philadelphia have organized a company for the purpose of supplying artificial gas on a large scale for fuel purposes—the first organization of the kind, we believe, in the country. It is proposed to furnish consumers with gas at a cost not to exceed 50 cents per thousand cubic feet.

In this connection, we notice that the Westinghouse Machine Co., of Pittsburgh, have purchased a small tract of ground opposite their works, near Twenty-fourth street, on which they intend to erect at once a new furnace, in which natural gas is to be utilized in making pig iron. The process by which this is to be done is the patent of the superintendent of the works, and the fairest test possible is to be given to what he claims is a success.

THE advocates of bi-metalism will find an able pleader in Mr. F. J. Scott, who, in a brochure recently issued by the Barkdull Printing Co., Toledo, takes strong ground in favor of the equal recognition of silver with gold.

OUR BOOK TABLE.

THE Franklin News Co., Philadelphia, has issued an American reprint of the "Dictionary of Science," by G. F. Rodwell, F. R. A. S. It is in neat, cheap and convenient form and is amply illustrated. For the office and shop it is invaluable.

***

To Hon. James Bishop, Chief of the Bureau of Statistics of Labor and Industries of New Jersey, we are indebted for a copy of his excellent report for 1885. His chapters on the iron and steel industries are especially interesting.

***

MR. E. L. Cortell, C. E., has favored us with his reply to Rear-Admirable Ammen, in the matter of the Eads Ship Railway. Mr. Cortell brings out some interesting inside history regarding Gen. Grant's friendly feeling for Mr. Eads and his great project.

***

IT is a matter for congratulation that Mr. Frank F. Hemenway has given to the public in permanent form the valuable articles contributed by him to the *American Machinist*. This he has done by issuing an attractive little volume of 180 pages (John Wiley & Sons, New York, publishers) entitled "Indicator Practice and Steam-Engine Economy." We welcome this as a desirable addition to the rapidly growing literature on this important subject.

***

MR. J. C. HOADLEY, a well known mechanical engineer, has issued from the press of John Wiley & Sons, New York, a volume of 168 pages entitled "Warm Blast Steam-Boiler Furnace," being a report upon a series of trials of an apparatus for transferring a part of the heat of escaping flue-gases to the furnace by warming the entering air. Mr. Hoadley has given the subject great attention, and the results of his study and experiments will be read with general interest.

***

WE have been favored in the past with catalogues of various degrees of size, completeness and general excellence, but it has been reserved for the well-known hardware firm of Wm. Bingham & Co., Cleveland, O., to cap the climax of portly volumes, by issuing one of *one thousand, three hundred and twenty-five pages*, showing the myriads of articles sold by them. To show its completeness we need only say that it devotes ten pages to agate hardware; ten pages to bits; 18 pages to bolts; ten pages to hammers; 14 pages to valves; 21 pages to cocks, bibs, etc.; 7 pages to chucks; 25 pages to padlocks; 157 pages to locks and lathes, and so on.

***

THE Brown & Sharp Mfg. Co., Providence, R. I., deserve the thanks of practical iron-workers everywhere for the publication of a neat volume of 122 pages entitled "A Practical Treatise on Gearing." No firm in the country is better prepared to speak with authority on this intricate subject. Assisted by appropriate and well-executed engravings, the various branches are reduced to actual shop practice, with such clearness of definition that even the dullest ought to get a fair understanding of the different details. The analytical arrangement of the treatise is most admirable.

***

ALTHOUGH we have used somewhat freely from the Annual Statistical Report of the American Iron and Steel Association, we have not until this time been able to speak of the completeness and excellence of the work. Certainly the officers of the association have reached the very *par excellence* of statistical work, all the more conspicuous in contrast with similar attempts on the other side of the ocean, when it is considered that we have a very large country, with iron establishments widely separated and remote. We heartily congratulate General Manager Swank and Secretary Cope on the success of their labors.

***

WE welcome Griffiths' Brand Book of the Iron and Steel Manufacturers of Great Britain for 1886, a volume of nearly 150 pages, compiled by Mr. Herbert W. Griffiths, the accomplished editor of the London *Iron Trade Exchange*. We have heretofore spoken in favorable terms of Mr. Griffiths painstaking work in this line, and we desire to emphasize our previous endorsement. American iron men can obtain a copy of the volume by addressing the compiler at No. 89 Cannon street, London, E. C., and enclosing postal order for six shillings (English currency). It will be found invaluable to all interested in the iron, steel, tinplate, galvanized iron or tube trade of Great Britain.

SMOKE-CONSUMING DEVICES.

Referring to a smoke-consuming device noticed by the Manchester (Eng.) correspondent of the IRON TRADE REVIEW, *Modern Light*, of Boston, says:

The many devices for consuming smoke naturally attract attention on both sides of the Atlantic. In Boston may be seen the latest Yankee device; and, were it shown at the West, where soft coal is the common fuel, we do not doubt its immediate adoption. The principle as shown in stoves, we are told by those who claim to know, is in the effect produced by a reverse draught which necessarily consumes all smoke and gases in the coal, the flame passing through its own fire—the flame, the smoke, the gases gaining complete combustion. It is a novelty, and perfectly simple, and can be applied, if we are correctly informed, to the furnace or fire-box of boilers already set. There is not only economy in the setting, but in its use, as there are no iron grate bars to burn out, requiring frequent renewal. * * *

We are inclined to the belief that the English device may be a good one, the American burner differing in that the draught is reversed; the whole principle from that in common use being changed. This fact would place the Yankee notion far in advance of the former, as most of our inventions are admitted, even by our English cousins, to be superior to works of their own contrivance. Be this as it may, the American burner is said to have great merit in point of construction, durability, economy, and great simplicity. The fire is started from the top of the fire-box instead of at the bottom, and the whole effect of whatever there may be of heating qualities in the coal, oil, culm, leather waste, tar, pitch, pine knots, old rags, waste sugar cane; in fact, all burnable substance of trivial value most conveniently found can be consumed with the best possible results. All carbonaceous substances can be handled without smoke. In London and in our Western cities, a system which will effectually consume all gases and smoke, converting the same into heat, is obviously to be desired, and will be readily adopted.

BASIC STEEL FOR SHIP-BUILDING.

The reliability of basic steel for ship-building is not yet established. A year or two ago Lloyd's Committee intimated that they would accept vessels built of steel made from cheap pigs, but that acceptance has now been cancelled. It had for some time past been known that Lloyd's were dissatisfied with the quality of certain of the steel that was being put into their vessels, for the metal had been found to give way in the most erratic manner. The presence of phosphorus in excessive quantities has been ascertained to be the main cause of the trouble, and plates have been discovered which contained as much as ¼ per cent. of this element. Firms in the North of England and Scotland producing Thomas-Gilchrist steel are strongly contending, however, that the defects are not confined to their metal, but that experience is revealing that the Bessemer, and even the Siemens-Martin steel, is not always uniform. An agitation is suggested to induce Lloyd's to revise their latest proceedings, but there is some fear that such an agitation would not be wholly wise. It is thought, in some circles, that it might draw on the danger of Lloyd's extending their prohibition to the Bessemer materials. Bessemer makers who do not share these views are confidently pointing to the increasing use of their metal in the manufacture of steam boilers as an evidence of reliability. Recent sessions of the Iron and Steel Institute have established this position, and they contend that there is abundant private evidence in the same direction. The best of the acid steel makers are not, therefore, afraid of courting enquiry. It is, however, abundantly clear that there is yet much necessity for further earnest work in the perfecting of steel manufacture, particularly in the direction of the elimination of the phosphorus. Meanwhile, the new position which has just been created as affecting the great steel works in the North, which have adopted the Thomas-Gilchrist process for the production of ship-building material, demands the first attention.—[English Exchange.

AN IRON CENTER ON PAPER.

Anent the alleged iron center of Sheffield, Ala., claimed by the Baltimore *Manufacturers' Record* to have an existence, and replying to some further inquiries from the IRON TRADE REVIEW on the subject, the Chattanooga *Tradesman* says:

Several gentlemen, whose names have been bruited in in connection with this enterprise, have repudiated such connection when approached by responsible parties. Still, there seems more or less life in the concern, and we often hear of some party "resolving" to build a furnace at or a railroad to Sheffield. In fact, the place has no transportation to and from coal and iron, and therefore a man would be a lunatic who should put money in the talked-about blast furnace. It is not contiguous to either coal or iron ore. Both must be hauled considerable distances to reach its proposed furnace. We believe there has been some show of work on the road, apparently intended to tap coal and iron ore in Sheffield's interest. That anything substantial or tangible has been effected we cannot for a moment believe, as we have repeatedly tried to get connected and reliable knowledge concerning the furnace and railroad building "resolves," without success in a single instance. All we have ever been able to learn regarding Sheffield consists of the fact that a field or series of fields was bought by enterprising gentlemen; they laid out "a city;" they sold lots—probably mostly to each other; they did much talking as to how cheap iron *might* be made at Sheffield, *if* only the needful transportation were provided, etc., etc., etc.

THE OLDEST PUDDLER.

We present herewith an outline portrait of William Reese, of Bolivar, Pa., whose claim to be the oldest living puddler in the United States was printed in the IRON TRADE REVIEW of March 14, 1885, and has not since been contested. He is now just closing his 98th

year, and puddled in this country 54 years ago. Below we give a sketch of his life:

William Reese was born at Glostershire, England, June 1st, 1788. He worked in Wales for Messrs. Fayer & Jowel, at Slanelly, and for the Crosha's at Gafastha, and for Messrs. Bayliss at Nontaglo. On the 20th of June, 1815, he walked five miles to witness a grand illumination at Abergavassy, celebrating the victory at Waterloo and the downfall of Napoleon. In 1818 he married Elizabeth Joosph. In early years he and his wife united with the Baptist church at Llannennerth, at which place he often heard Francis Hiley and Christmas Evans preach.

In 1832 he brought his family to America, and was employed by Messrs. Reeves & Whitaker, at Phœnixville, 30 miles from Philadelphia. In 1833 he succeeded in gathering a sufficient number of Baptists together to form a church, and thus the first Baptist church of Phœnixville was formed, 53 years ago. In 1834 he was engaged by Thompson & Savage to build an iron works, and he removed with his family to the wild mountain region, 15 miles from Huntingdon, Pa. Here in the mountain gorge on the banks of Trough Creek, he built a charcoal blast furnace, run-out fire, two knobbling fires, one dandy puddling furnace, with hammers and rolls for working the iron. He made his own drawings and superintended everything in the construction and running of the works. He didn't like to hear the wolves growling around the house at night, so he removed his family to Belfonte in 1835, and was engaged in introducing the puddling process at Valentines & Thomas's works. In 1837 he removed with his family to Pittsburgh, and was engaged with Hogg, Benler & Co., and others. He was a practical iron worker in all its branches, and taught his boys the theory and practice of metallurgy. He had five sons and five daughters. The wife and three children have gone before, while seven children and the father are still living.

William Reese lives with his son Benjamin, at Bolivar, Pa.; he has been actively engaged as a puddler, heater, roller and manager of iron works for more than 70 years, and even now, while nearing his centennial, is hale and hearty, with a mind as clear as it was 50 years ago. He has been a deacon in the Baptist church for over 50 years, and never drank a drop of liquor, nor was he sick a day in all that time. He reads the papers without glasses, and hopes to live long enough to see the basic process (invented by his son Joseph Reese, of Pittsburgh) put into use in this country.

A WORD OF ADVICE TO ENGINE OWNERS.

Why is it that some engine owners have such false notions regarding the condition of their engines? They seem to have the idea that as long as an engine will turn over, there cannot be anything the matter with it. They do not realize the true state of the case, that such a piece of mechanism cannot, in the nature of things, continue in the same condition. When it begins its life work, it must of necessity commence to deteriorate and wear out; that with the best of ordinary care it has a continual tendency to change its condition, to get out of line, to wear its bearings, to have lost motion in its connections, to have the relative time of the valve motion change, to have the valve surfaces wear uneven, the cylinders to become untrue, the piston packing to leak, and so on through all the various parts that comprise the complete machine.

Very often the engineman finds that, calling attention to such conditions only results in his becoming aware of the disagreeable fact that if anything is the matter he must bear the responsibility; that any such deterioration must necessarily be his fault.

There are, of course, men in charge of engines who are careless and do not carefully, day by day, do what they can to make the unavoidable wear and change as slight as possible. A certain proportion of these men have not the training as machinists to make them competent to correct this deterioration. What is wanted is for the owners to realize the fact that engines will wear out. That as a rule this deterioration results in loss of economy and shortens the life of engines, and that the best results, both as regards the regulation of speed and minimum cost to run them, depends on their being frequently thoroughly examined, and these various changes corrected by competent mechanics, so that they will be kept in as complete order and condition as at first.

Especially is this the fact as regards the internal portion of the mechanism. A change in the set of the valves, a leaky piston, or valve wear, may be causing an increase of steam consumption of 25 or 30 per cent., while the external movements may not indicate any change.—[Unknown Exchange.

STEAM PIPES IN FLOORS.

To the Editor of the IRON TRADE REVIEW:

In regard to the casings of iron for "steam pipes in floors," recommended by Western Manufacturers' Mutual Insurance Company, in your issue of the 8th inst., we would say that we have been using them for some time, and would also recommend them.

MT. JOY, Pa. MT. JOY STEAM HEATING CO.

The Readjustment of Wages.

American Artisan, Chicago.

There has already been quite a general and widespread readjustment of wages in iron industries. This is particularly true of foundries, including not a few stove foundries. The IRON TRADE REVIEW, Cleveland, publishes the names of a number of iron works and of nearly sixty foundries in which wages have been advanced from 10 to 15 per cent. These reports were mostly of changes which occurred in the month of April. The present month will witness some advance in wages, but not as much as if a quieter course had been pursued. So much excitement has been stirred up, and the demands for labor have been presented in so threatening a manner as to impel employers to unite in protecting their interests.

PEAT is extensively used on the Northern Railway of Russia for fuel. Machines turning out 40,000 bricks daily are made at Moscow.

CANALS are a drug in the market in Ohio. The State wants to lease or sell, but the capitalists to rent or buy have not yet appeared.

THE semi-annual meeting of the National Association of Stove Manufacturers will be held at Cleveland, June 2.

AUTOMATIC air brakes must hereafter be put on all circus trains running on Western railroads.

Heinz & Munschauer, Buffalo, N. Y.,

Nos. 2 to 22 Randall St. and 12 to 20 Superior St.

MANUFACTURERS OF

Brass and Japanned Bird Cages,

Assorted Case Cages.

REFRIGERATORS,

Grained and Hardwood.

Water Coolers and Filters, Coal Hods and Vases,

Children's Sleighs,

and Jobbers in

White Mountain Freezers,

TEA TRAYS, KETTLES,

—AND—

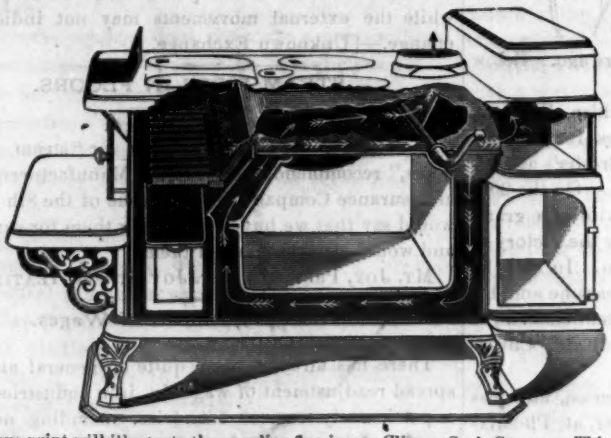
HOUSE FURNISHING GOODS

Send for Illustrated Catalogue and Price List.

CLIMAX COOK,

For Soft Coal

Is in every particular a cooking stove of the first-class. The proportions, size, style and finish are second to none. It is constructed with our Patent Oven Flues, which are far superior to the old return flue in general use. The Reservoir is of Nickeled Copper, with deep stamped pit, and is effectually heated without an extra damper. Side Shelves for the top can be put on when required. A cast Pan attached to a swing bracket under the hearth, provides a neat receptacle for the stove covers when removed from the top of the stove.



The above print will illustrate the peculiar flue in our Climax Cook Stoves. This plan insures the even distribution of the heat to all parts of the oven. No other stove or range has this flue.

Taplin, Rice & Co. MANUFACTURERS, **AKRON, O.**

Cleveland Foundry.

Castings

For Machinery and Rolling Mills

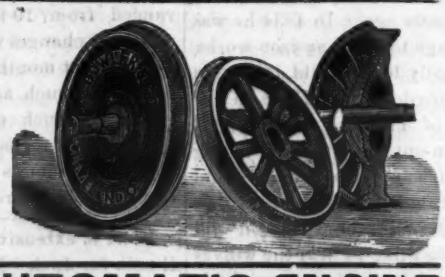
Car Wheels

All sizes and kinds, with and without Axles.

Chilled Faced R. R. Frogs

STREET RAILROAD TURNOUTS.

Nos. 9, 11 & 13 Vinter Street. } **Bowler & Co**



THE BUCKEYE AUTOMATIC ENGINE

Highest Economy. Best Regulation. Superior Construction.

These engines are constructed for heavy and continuous duty, medium or high rotary speeds.

Illustrated Catalogue sent free.

Address **Buckeye Engine Co.,** SALEM, OHIO,

—OR—

W. L. SIMPSON, Eastern Sales Agent, 70 Astor House, N. Y.

N.W. Robinson, co., Chicago Sales Agent. **Clinton & Jackson-sts., Chicago, Ill.**

AGENTS WANTED for the MISSOURI STEAM Washer

Active, honest persons all over the country, with or without team.

JOHN C. EVANS, SHOTLAND, MO., writes: "I stand up and affirm that a Washer saves more hard labor and money in a large family than any Reaper and Mower that ever was put on any farm with less than 100 acres in cultivation. If you will get up any instrument that will take as much labor off of men as this Washer takes off the women, and save as much money as it does and cost no more, I could sell one at every house. If they had to take the feathers from under their wife and babies to pay for it."

JOHN R. DODGE, JR., jeweler, NORMAL, ILL., writes: "You ask what I think of the Washer I bought last summer. 1st. It is the best machine ever invented by man. 2d. We have just as good dinners on Monday as on any other day. 3d. If you run short, you can not buy ours for $1000."

I will ship a sample to those desiring an agency on a week's trial on liberal terms. A thousand per cent the best washer in the world for saving labor, clothes and soap. Pays capable agents big money. Write for particulars.

J. WORTH, 1710 Franklin Ave., St. Louis, Mo.

WANTED An active Man or Woman in every county to sell our goods. Salary $75 per Month and Expenses. Canvassing outfit and Particulars FREE. STANDARD SILVER-WARE CO., Boston, Mass. 23-6m

A BIG OFFER. To introduce them, we will GIVE AWAY 1,000 Self-Operating Washing Machine. If you want one send us your name, P. O. and express office at once, **The National Co.** 3 Dey Street, NEW YORK 26tw

Novelty Iron Works.

Nobles & Sherlock

PROPRIETORS,

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Architectural and General Jobbing Castings.

Light Gray Iron Castings a specialty

Also manufacturers of **COAL MINE CARS.** Correspondence Solicited.

84 CANTON, OHIO.

SPECIAL NOTICE

TO MANUFACTURERS.

THE CALUMET & CHICAGO CANAL & DOCK CO.,

The largest land owners at SOUTH CHICAGO and in the Calumet Region, offer on liberal terms

SITES FOR FACTORIES,

Lots or acre property on river and railroad, connecting with the **B. & O., Chicago & Atlantic, Chicago & E. Illinois, Chicago, R. I. & P., Chicago & W. Indiana, and Belt Line, Ill. Cent., L. S. & Mich. So., L., N. Albany & Chicago, Mich. Cent., N. Y., Chicago & St. Louis and P., Ft. W. & Chicago Railroads.**

Number of passenger trains to and from Chicago to South Chicago daily is about 75 each way.

Also Docks on Calumet River, with its splendid harbor at South Chicago, and the only river property connecting with the Belt Line, which also connects with every R. R. entering Chicago.

Towage One-Half Chicago Rates.

Capital invested at this point alone,	**$9,000,000.00**
In buildings and plants,	**4,100,000.00**
Value of product last year,	**9,000,000.00**
Lumber received last year,	**105,000,000 Ft.**

Among the many large establishments already located are the North Chicago Rolling Mill Co.'s Bessemer Steel Rail Mill, the Calumet Iron and Steel Co.'s Rolling Mill and Nail Manufactory, The Morden Frog and Crossing Works, Chicago Forge and Bolt Works, &c., &c.

MANUFACTURERS, or shippers of **COAL, PIG IRON, IRON ORE LUMBER, ETC.** also parties who wish to build **GRAIN ELEVATORS** will please correspond with us.

Contractors for River and Harbor Improvements, Dredging Dock and Pier Construction, Pile Foundations, etc. Estimates on application.

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BLACKSMITH HAND BLOWERS,

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The Lightest Running! The Strongest Blast! The Most Durable!

ADAPTED TO ALL KINDS OF WORK,

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THE FOOS MANUFACTURING CO., - - Springfield, Ohio.

The McCoy Manufacturing Co.

Manufacturers of **McCoy's Patent Clips, and Wagon, Farm and Street Car Double Trees and Neck Yokes.** Also, **Combined Triple and Double Tree.**

Write for Circular and Price List. Mention this paper. [1] INDIANAPOLIS, IND.

J. STEVENS & CO.,

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Chicopee Falls, - Mass.,

MANUFACTURERS OF

Spring Caliper and Dividers,

FINE MACHINIST TOOLS AND FIRE ARMS.

Our SHOOTING GALLERY RIFLE

IS THE FAVORITE EVERYWHERE.

SEND FOR ILLUSTRATED CATALOGUE.

Industrial Notes

IRON AND STEEL WORKS.

Blast Furnaces.

*** MESSRS. Gordon, Strobel & Laureau, of Philadelphia, have made a contract with the Western Steel Co. for the improvement of furnace C, which calls for three Gordon-Whitwell-Cowper stoves, the raising of the furnace to 75 feet, ring coolers, and all modern details. A statement of the receiver of the St. Louis Ore and Steel Co., lessors, show that these changes will cost $48,000, and will increase the output of the furnace from 100 to 150 tons a day.

*** TOPTON Furnace (anthracite) in the Schuylkill Valley, owned and operated by Wm. M. Kaufman & Co., and which has been making a successful run of several years will shortly be blown out for relining the stack and also for heightening it to the extent of about 15 feet. The furnace now makes from 40 to 45 tons of iron per day, and it is expected that the proposed added height to the stack will increase its production about one third, making a total production of about 55 tons per day.

*** THE record of Alice Furnace No. 2, at Birmingham, Ala., is especially interesting because it goes a long way in refutation of assertions often heard in deprecation of large furnaces. This stack is 75 feet high and has a 17-foot bosh. Six months ago 90-odd tons a day was the best average it ever made for any considerable time. Since then it has been steadily improving, until finally it has made 150 tons of iron a day. Last month it made 4,098 gross tons. Of the output of one of the 150-ton days all but 17 tons was foundry iron, and the work of two consecu ive days, aggregating 246 tons, was of these grades altogether. The improvement has been effected, too, at a considerably reduced cost in the matter of fuel, and without material change of ores. The better results are due mainly, it seems, to modifications of charge suggested by much closer chemical study of what comes out of the furnace, especially of the slag.—[Iron & Steel Bulletin.

Rolling Mills, Nail Mills, etc.

*** TRADE is improving rapidly with the Western Forge and Rolling Mill, and an increase in the force of employes is anticipated shortly.—[Industrial Gazette, St. Louis.

*** THE Hazard Wire Rope Co., Wilkesbarre, Pa., have recently completed a rope 24,800 feet in length, all in one piece, for the Philadelphia Traction Railway Co. It weighed 32 tons net.

*** THE directors of the Ætna Rolling Mill, at Bridgeport, O., opposite Wheeling, anno ince a change in the corporate name from the Ætna Iron and Nail Co. to the Ætna Iron and Steel Co.

*** DESPITE a week's lost time the nail factory of the E. & G. Brooke Iron Co., at Birdsboro, Pa., manufactured for April 20,000 kegs of nails. The work of erecting the additional house for the storage of nails is progressing rapidly.

*** ABOUT a week ago at the Valley mill the firm began the erection of a Smi h Gas Heating Furnace, similar to the one recently finished at Brown, Bonnell & Co.'s. The furnace will be a little larger, having four doors, while the one at the big mill has but one.—[Youngstown (O.) Telegram.

*** THE Apollo Steel and Iron Works, of the P. H. Laufman Co., Limited, is being rapidly pushed to compushed to completion. The foundations of the furnaces and superstructure are all in and the iron for the building is being delivered. The main building will be 90'x200', all iron; the boiler-house 32'x70'. The mill will contain two sets of machinery rolls, one 38", the other 48"; two sets finishing rolls same size; two sets cold rolls 34" and 42", respectively, and one train bar rolls. There will be two annealing, two sheet, two pair and two pile furnaces, with the necessary boilers, engines, shears, pumps, etc. The capacity will be 4,000 tons finished sheets per year. The product, smooth rolled sheet iron and decarbonized sheet steel. Natural gas will be used as fuel. The mill will be in operation about August, 1886. The West Penn. railroad, from which side tracks will be laid, runs alongside the mill, so that all material will be received in and products shipped from the mill yard.—[American Manufacturer, Pittsburgh.

Machine Shops.

*** THE Porter-Hamilton engine described in these columns last week is manufactured by Wm. Tod & Co., Youngstown, O. Through inadvertance their name was omitted.

*** THE machinery and entire plant of the American Steam Engine Works, Chicago, have been sold to Warren Springer.

*** E. E. GARVIN & Co., 141 Center street, New York City, have already secured extensive appliances for manufacturing the Hammond type-writer, in lots of 5,000 each. They are now putting in machinery and men sufficient to double their capacity for manufacturing this machine.

*** HUGHES BROS., manufacturers of steam pumps, have been crowded with orders since moving to their new works, at the corner of Elm and Washington streets. They are employing a full force of men on full time, and have just completed a large order for pumps and presses for a Pittsburgh oil firm, and are now making large-sized pumps for same parties. Their capacity is now double what it was in the old location, and the press of business demanded more room.

*** THE Warren Machine Works presents a scene of rushing activity. In the neighborhood of twenty skilled workmen are employed, and more men are soon to be put on. Saw mills and road engines are being built to fill orders from all parts of the country, and an occasional order comes from South America. The force is now engaged in building an improved and patent road engine, which is giving universal satisfaction, and is the only engine of the kind which pans out to be a success in every pa ticular. Traction engines are being built for parties in Leavittsburg and Bristol, and they already have orders from several parties in Kentucky for their new engine. Patterns for narrow gauge locomotives have been completed, and as soon as the proper machinery can be made, the manufacture of this class of locomotives will be commenced.—[Warren (O.) Chron'cle

Foundries.

*** NEW YORKERS report the Western cities large purchasers of building material, iron and steel pipe, etc. St. Louis has just bought 5,600 tons of water pipe which an Eastern firm came very near taking. The demand for pipe throughout the Western towns and cities will be exceptionally heavy this year.

*** TAPLIN, RICE & Co., of Akron, O., have purchased a shop right to manufacture the Bradberry patent combination blower and fire screen from H. Anshutz Bradberry Co., Pittsburgh, Pa., of which firm W. T. Bradberry, the inventor, is a member. This feature has made the Tremont parlor stove famous wherever introduced.

CHANCES FOR CONTRACTS.

New Enterprises, Extensions, etc.

Name.	Address.	Remarks.
FOUNDRIES.		
Carolina Foundry Co.	Hickory, Pa.	$4,250 capital.
R. Smith	Pontiac, Ill.	——
J. Wall	Greenville, Miss.	——
E. G. Blakeslee	Sing Sing, N. Y.	——
Lebanon Mfg. Co.	Lebanon, Pa.	203x60 ft.
Co e Bros	Parkersburg, W. Va.	——
MACHINE SHOPS.		
T. A. Watson	E. Braintree, Mass.	——
Memphis & Birmingham R. R. Co.	Birmingham, Ala.	——
Geo. Place Machine Co.	New York City.	$150,000 capital.
U. S. Mfg. Co.	New York City.	5,000 "
Cincinnati & Eastern R. R. Co.	Portsmouth, O.	——
E. Banfill	Presque Isle, Me.	——
HARDWARE.		
Pittsburgh Mfg. Co.	Marseilles, Ill.	Agr'l Implem'ts
Citizens	Albany, Ore.	Plows.
Hicks Harrow Co.	Atlanta, Ga.	——
Wire Fence Implement Co.	Chicago, Ill.	$150,000 capital.
Kistner Mfg. Co.	Bordentown, N. J,	Hdwe. novelties
E. Balmes	Chattanooga, Tenn.	Shelf hardware.
Standard Horse Nail Co.	Fallston, Pa	$60,000 capital.
U. S. Wire Nail Co.	Indianapolis, Ind.	Addition.
IRON AND STEEL.		
Crucible Steel Co.	Chicago, Ill.	$10,000 capital.
Canonsburg Iron & Steel Co	Canonsburg, Pa.	$115,000 capital.
Belleville Nail Works	Belleville, Ill.	Bessemer plant.
Rosenberger Bros.	St. Cloud, Minn.	Iron works.
Harris & Winslow Co.	Chicago, Ill.	Architect'l iron
Lowell Wire Works	Lowell, Mass.	$20,000 capital.
Edith Furnace Co.	Allegheny, Pa.	$30,000 capital.

*** JAMES SHERIFFS, engine builder, Milwaukee, Wis., proposes to open a boiler shop.

*** IT is reported that Northern capitalists will spend $600,000 in establishing car works at Norfolk, Va.

*** SEVERAL well-known capitalists are considering the matter of establishing an iron ship-building yard at Bath, Me.

Fires in Iron Works.

*** O. R. RAND'S machine shop, Goldsboro, N. C., was burned; loss $4,200. Will be rebuilt.

*** COPP BROS.' foundry, Hamilton, Canada, was damaged by fire on the 6th inst., to the extent of $40,000; partially insured.

*** J. S. DOWRY will rebuild his machine shop at Winchester, Ky., reported as burned; loss $3,000.

*** THE foundry and boilers shops of the Michigan Iron Works, Cadillac, Mich., which were recently destroyed by fire, are being rebuilt.

GENERAL IRON TRADE NOTES

Hardware.

*** THE Bristol Handle Works, Bristol, Tenn., will enlarge their works by putting in new machinery.

*** THE Southern Wire Co., St. Louis, propose increasing their capital stock from $50,000 to $150,000.

*** THE Omaha Barb Wire Co. are erecting new buildings in that city, and will increase their plant for the manufacture of barb wire, and will also introduce machinery for the manufacture of wire nails.

*** KNOTT, HARKER & Co., Beaver Falls, Pa., have sold all their right, title and contract in their patent ent coffee mill to the Charles Parker Co., Meriden, Conn., and the patterns, etc., have been already sent to Meriden. Knott, Harker & Co., will continue in business and manufacture grates, fire-fronts, fenders, etc., as usual.

Miscellaneous Iron Works.

*** GEO. HEARTLEY, Toledo, O., manufacturrer of the Heartley eave troughs, punches and shears, has just moved into his large and commodious shop, which is all of brick. Mr. Heartley has lately brought out a new punch, which has considerable merit. He reports trade very good.

*** THE Brown Hoisting and Conveying Machine Co., of Cleveland, has recently sold a cable tramway plant 375-foot span, to go to the Gogebic Mining District. The plant is to be used on the Aurora Mining Co.'s property to strip the vein. The excavation required is 18 feet in depth, 150 feet in width, and 600 feet in length.

*** THE Sidney (O.) Steel Scraper Co. have recently erected a large factory, 100 by 50 feet, two stories in height, with a wing one story in height, and measuring 40 by 50 feet, in which the forging and annealing department is contained; the lower floor of the main building is used for construction purposes, while the upper floor is used for painting and storage. Two additions to the building mentioned are used as a grinding department and engine and boiler rooms.

Railroad Notes.

The C., C., C. & I. Ry. has arranged for a series of cheap excursions to Georgia; tickets to be good going in specified trains of May 31, June 1 and 2, holders returning at pleasure within 30 days from date of sale.

The Nickel Plate Railroad will give one of its popular excursions to Chicago May 25; round fare from Cleveland, $7.05; tickets good for seven days.

IT is erroneously stated by many writers that a reduction from 10 to 8 hours as a day's work, with no reduction in wages, is equivalent to an increase of 20 per cent. in the cost of production. The increase in cost is 25 per cent.—[Bulletin.

LIST OF PATENTS

Relating to Iron, Steel, Metal, Machinery, Hardware and Mining Interests.

Reported expressly for this paper by Chas. J. Gooch, Solicitor of Patents, Washington, D. C.

BEARING DATE MAY 11, 1886.

Machine for cutting teeth upon saw and other similar blanks, J. A. Dicus, Springfield, Ohio.
Wheel, W. W. Dunn, Peoria, Ill.
Roll dressing machine, W. M. Ferry, Park City, Utah.
Crucible tongs, J. B. Green, Stamford, Conn.
Hammer, C. J. Greliner, St. Louis, Mo. (2 patents).
Blank clip for spring heads, E. J. Hess, Cincinnati, Ohio.
Paper file, C. Husted, Chicago, Ill.
Reversing mechanism for machinery, J. S. Masterman, Chicago, Ill.
Seal-lock, A. P. Powers and S. W. Wilkes, Atlanta, Ga.
Safety-stop for mining cages, etc., J. W. Terman, Des Moines Iowa
Wheel, H. Timkin, St. Louis, Mo
Rolls for re-working old rails, J. D. Williams and J. P. Raidabaugh, Danville, Pa. (2 patents).
Shutter fastener, A. C. Wolfram, St. Louis, Mo.
Grinding mill, T. Beall, Decatur, Ill.
Sash fastener, E. S. Cory, Big Rapids, Mich.
Lock spindle for safes, J. Dyer, Canton, Ohio.
Rolling I-beams into plates W. H. Graham, Pittsburgh, Pa. (2 patents).
Dumping wagon, Reuben A. McCauley, Baltimore, Md.
Window cleaner, C. Michelsen, St. Paul, Minn.
Flanging machine, J. O'Brien, St. Louis, Mo.
Trunk clamp, H. Rice, Aurora, Ind.
Pumping and drilling machine, A. W. Carnahan, Rousevile, Pa.
Elevator, M. W. Clark, Parma, Mich.
Tool for clinching fence wires, H. E Lambert, Logansport, Ind.
Saw handle, B. H. Ten Eyck, Emporium, Pa.
Grate for stoves, G. M. Cooper, Port Huron, Mich.
Gold washing apparatus, S. S. & C. L Heller, Boulder, Colo.
Boring bar, H. Otto, Bloomington, Ill.
Seal lock, R. M. Sully, Petersburg, Va (2 patents)
Flux for welding, E. A. Whi comb and J. J. Riddle, Cincinnati, Ohio.
Welding flux, E. A. Whitcomb and J. J. Riddle, Cincinnati, Ohio.
Drill machine, J. C. Muirhead, Grub Gulch, Cal.
Dumping cart, M Conrad, Chicago, Ill.
Amalgamator, J. W. Van Brocklin, Seattle, Wash.

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WALTER N. BOWLER, Trustee,
17 Merwin street.
May 15, 1886. 02-4w

Patents.

H. T. FISHER,
Solicitor and Counselor.

Lat. Examiner U. S. Patent Office. Eight year experience in Examining Corps. The best of references. Patents obtained by me will be described in this paper free. 26
25 Blackstone Building, CLEVELAND, O.

CLEVELAND BUSINESS DIRECTORY.

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BABCOCK, MORRIS & CO., —COAL.— Grand Arcade Building, Cleveland, O. 5

PICKANDS, MATHER & CO., Iron Ore and Pig Iron, 101 St. Clair St. 61

SANGER, A. I., wholesale Scrap Iron. Nos. 173, 175 & 177 Merwin Street. 33

Carriage Bolts.

THE COLWELL & COLLINS NORWAY BOLT CO., manufacturers of Philadelphia Carriage and Tire Bolts. 41

Foundries.

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GEORGE K. HOSFORD, Manager. 30

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TAPLIN, RICE & CO., manuf'rs. of Stoves and Hollow Ware, dealers in Tinners' Stock, etc. 04

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Canton, O.

NOVELTY IRON WORKS, Mill Work, Shafting, Engines, Imperial job printing press etc. 73

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CURRY & CO. general jobbers in Castings of all kinds. 43

Niles, O.

REEVES BROS., Manufacturers of Boiler, Tank and Sheet Iron Work, etc. 64

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GOWE JNO. N. mfr of Specialties, such as Machine forging, bridge bolts and trusses railroad switches, spike, mall, chisels, &c. 23

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WELLS, CHARLES & SONS, manuf'rs. of Mill Picks, Stone Cutters' Tools, and Edge Tools in general. 61

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CLEVELAND, O. 40

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STEEL TIRE AND FORGINGS.
Galvanized and Black Sheet Iron, Steel and Iron Boiler Plate, Steel Hoops.
Wm. Chisholm, Pres't; W. V. Chisholm, V. Pres. Ed. S. Page, Secretary. 61

MARKET REVIEW

OFFICE OF IRON TRADE REVIEW.
CLEVELAND, O., FRIDAY EVENING, May 21, 1886.

Iron Ore.

The iron ore market remains quiet, and nothing has occurred to relieve the monotony of light sales and dull trade. Transactions are by no means frequent, and there is little to indicate a realization of the improvement predicted for the latter part of the present month, and the belief gains strength that, at least, as long as the present depression in business continues, many of the furnace operators will refuse to anticipate their wants and only buy from hand to mouth as necessity demands. Prices of non-Bessemers may be, perhaps, a little inclined to weakness, but it is claimed that the larger mines, which have a large proportion of their product already contracted cannot afford to make any reduction, and that the ore will rather be left in the ground. Small mines with uncertain quality ores are said to be the only ones offering at less than market prices. Lake freights are firmer and $1.00 is asked from Escanaba, but charters have been made at 95 cents; $1.25 is asked from Ashland. Up to and including May 12th ore had been forwarded from the upper lake ports as follows: From Marquette, 43,191 tons; St. Ignace, 4,743 tons; Escanaba, 103,172 tons. There have been 26,731 tons received at Cleveland the past week, and 20,258 tons shipped. We quote:

No. 1 Specular and magnetic Bessemer ores per ton.	$6 25
No. 1 Specular (non-Bessemer) ores per ton	5 50
Bessemer Hematites	$4 75@5 50
Non-Bessemer Hematites	$4 00@4 50

Pig Iron.

The slight improvement in the pig iron market noticed last week has lost nothing in volume, and a still better tone is apparent this week. The number of inquiries shows a marked increase, and transactions, though limited in quantity, are more frequent. Buyers, however, are still very conservative, and show no disposition to contract for supplies in advance of wants; the improvement noticed being the result of positive and urgent requirements. There are still indications that prices are weaker and pig iron is being sold for less money than 30 or 60 days ago, but the leading local dealers claim that their prices have not varied in the least, and that they can find ready sale for all they can make at rates previously obtained. In explanation they say that the extra quality and standard regularity of the irons may influence buyers and induce them to pay slightly better prices for them. However that may be, they do seem to get more money for their iron than others who are offering in this market. In regard to charcoal pig iron we lower our quotations, contrary to the protests of some of the leading sellers in this city. There seems to be some difference of opinion in this matter. Some incline to the opinion that values are lower, while those who are selling right along say that they are not materially so. The lowest of three quotations from Detroit furnaces for No. 5 was on the basis of $21 cash on cars at Cleveland. It is claimed that sales of car load lots of Nos. 1 and 2 have been made the past week at $22 cash, and of Nos. 3 and 4 at $22.50 cash. On the first of May there were in blast 45 charcoal furnaces, with a weekly capacity of 8,211 tons; 119 anthracite furnaces, with weekly capacity of 37,931 tons, and 129 bituminous furnaces, with weekly capacity of 67,888 tons. Out of blast: 139 charcoal furnaces, with weekly capacity of 11,588 tons; 79 anthracite furnaces, with weekly capacity of 15,965 tons; 83 bituminous furnaces, with weekly capacity of 30,200 tons. We quote:

CHARCOAL PIG IRON.

Nos. 1 and 2 Lake Superior charcoal	$21 00@22 00
Nos. 3 and 4 Lake Superior	21 50@22 50
Nos. 5 and 6 Lake Superior	20 00@21 00
Southern Car Wheel	25 50@28 50

BITUMINOUS AND COKE IRON.

No. 1 Bessemer	$19 50@21 00
No. 1 foundry, all lake ores	18 50
No. 2 same	17 50@18 00
No. 1 foundry, lake ores, with cinder mixture	17 50@18 00
No. 2 same	17 00@17 50
No. 1 foundry, native Ohio ores	19 00
No. 2 same	18 00
No. 1 silvery, native Ohio ores	19 00
No. 2 same	18 00
No. 1 gray forge, red short	16 50@17 00
No. 1 gray forge, neutral	15 50@16 50
No. 1 Ohio Scotch (Softener)	18 75
No. 2 Ohio Scotch "	18 25

We are in receipt of a circular announcing that, on account of the death of Col. S. Churchill, the firm of Churchill, Thomas & Co., pig iron dealers of Columbus, O., will be succeeded by Messrs. Chamberlain, Wheeler & Co.

Manufactured Iron.

The manufactured iron market shows a slight increase in the volume of business, but prices continue low and unsatisfactory.

Hardware.

The hardware business is in a fairly satisfactory condition. Demand is of a routine nature and is made up largely of calls for general hardware to keep assortments complete, thus creating a steady, small order trade which amounts to considerable in the aggregate.

NAILS.—The demand for nails is very light for this season of the year, and prices are correspondingly weak. Prices have dropped to $2.10 for iron, and $2.35 for steel from store.

Metals.

The metal market continues very quiet as far as local trade is concerned. Copper is firm, tin fluctuating, and other metals about the same as previously reported, but all have a tendency upward.

Coke.

The coke trade is developing renewed activity, and, practically, the entire available oven capacity of the Connellsville region is being crowded to its full extent. The fact that the operators seem pretty well satisfied with the present rate of $1.50, and are able to make profit at that rate seems to act as an incentive to the workmen to be exacting in their demands, and some of the most ridiculous nature are conceded rather than precipitate a strike.

DETROIT PIG IRON MARKET.

Reported for the IRON TRADE REVIEW by Charles Himrod & Co.

It would be rather a difficult thing to write an interesting report on the condition of the iron market here, as far as consumption goes in Detroit and Michigan. The recent labor troubles, while they are being rapidly settled, and we anticipate that they will be effectually by the 1st of June, having caused such a serious interruption to business and lack of confidence on the part of consumers of pig iron, that the market is entirely without any new features, with one exception, namely, the strength that is exhibited on charcoal and the coke irons coming from Ohio and Pennsylvania. As much cannot be said respecting the Southern furnaces, who are getting so anxious to sell that their prices have fallen off considerably. This is readily explained when we think of the quantity of Bessemer iron that is being made in the North, while none of it is being made in the South. Looking ahead somewhat, both the manufacturers using the iron, and the manufacturers of the iron themselves, seem to think that there are good things in the immediate future and that better prices will come, with a more active trade following immediately in the wake of the labor troubles. We trust their predictions may be true. Some quantities of Lake Superior charcoal have been sold, but chiefly in the East, where, however, the purchases have not been far in advance of actual needs but by consumers, where compelled to buy at this time, as they usually do as soon as the season of navigation is open. With a very dull market we should report quotations about as follows (May 19):

Lake Superior Charcoal, all Nos. $22 00@$22 50; Lake Superior Coke, all ore, $20 25@$21 00; Lake Superior Coke, cinder mixed, $19 00@$20 00; Standard Ohio Blackband, $20 25@$21 00; Southern No. 2, $17 50@$18 00; Southern Silvery, open, $17 50@18 50; Southern Silvery, close, $16 75@$17 25; Jackson County (Ohio) Silvery, $18 50@19 25; American Old Iron Rails, $22 00@$24 00; Old wheels, $17 00@$18 00.

CINCINNATI PIG IRON MARKET.

Reported for the IRON TRADE REVIEW by A. Pluemer & Co.

The market is weak, and the tendency is downward. The best No. 1 Hanging Rock coke iron is scarce and brings good prices, but nearly all other grades are difficult to sell, except at a reduction. Prices of labor and material entering into cost of iron have increased, and the output is larger. There is but one feature which promises at least a fair demand, when the labor agitation is disposed of. The Railroad building projected is twice that for 1885.

Reported for the IRON TRADE REVIEW by Rogers, Brown & Co

The market has been dull for the week past. There has been, however, a run of small orders for prompt delivery that have made a moderate aggregate of business. The labor situation is not cleared up yet, and dealers do not expect any considerable buying movement until manufacturers are in position to know whether they will continue work, and what wages they will pay. Most of the foundries in this region have reached an agreement with their men, but strikes among machinists, safe makers and other trades, have greatly restricted the demand for castings, and work is proceeding on a reduced scale. Prices for such business as is going stand where they have been since the first of the month. A large order would probably induce competition that would shade a trifle the minimum figures we name. It is very certain that prices cannot go much lower, unless the whole basis of cost is reconstructed, or producers draw on their capital for the pleasure of making sales. We quote for cash f. o. b. cars Cincinnati (May 17):

HOT BLAST FOUNDRY IRON.—Ohio and Southern Strong Coke, No. 1, $17 50@$17 50; Ohio and Southern Strong Coke, No. 2, $16 00@$16 50; Ohio and Southern Strong Coke, No. 3, $15 50@$16 50; Ohio Soft Stonecoal, No. 1, $17 50@$18 00; Ohio Soft Stonecoal No. 2, $16 50@$17 00; Mahoning and Shenango Valley coke, No. 1, $18 00@$19 00. CHARCOAL IRON.—Hanging Rock, No. 1, $20 00@$21 00; Hanging Rock No. 2, $19 00@$20 00; Tennessee and Alabama, No. 1, $18 00@$19 00; Tennessee and Alabama, No. 2, $17 00@18 00. FORGE.—Strong Neutral Coke, $15 00@$15 50; Mottled Coke, $13 50@$14 00, Cold Short Coke, $14 00@$14 50. CAR WHEEL MALLEABLE—Southern Car Wheel Iron, $21 00@$25 00; Hanging Rock Cold Blast, $26 00@$28 00; Hanging Rock Warm Blast $21 00@$23 00; Lake Superior Malleable, $23 00@$24 00.

CHATTANOOGA PIG IRON MARKET.

Reported for the IRON TRADE REVIEW by Lowe & Tucker.

General business can be reported as good. All the crops are catching up the time lost by a late Spring, and are now nearly up to time, and are looking well. Some embarrassment is being experienced by large producers of lumber, whose markets have been North and West caused by some of the large contracts being suspended in consequence of the labor troubles; so far, however, no trouble has been experienced in their getting their paper tided over until times change. The condition of the pig iron market can hardly be described, the greatest obstacle now, however, is in getting cars to ship. The near approach of the time of the change of gauge has side-tracked thousands of cars, in preparing them for the narrow gauge; but the next two weeks will probably solve that problem. On large lots a concession in prices may be conceded of from $1.00 to $1.50 per ton; although the product of favorite brands are held firm and are sold well ahead We quote (May 17):

No. 1, Foundry $15 50@$16 50; No. 2, Foundry $14 50@15 00, American Scotch, $14 50@$15 00; Gray Forge, $13 00@$14 00; Car Wheel Iron, $23 00@$25 00; Ores, Red and Brown, $1 50@$2 25; Furnace Coke, $2 00@$2 30; Bar Iron, per 100 lbs, $1 75; Old rails $21 00; Old wheels, $15 00; Wrought scrap, No. 1, 70c.; Wrought scrap, No. 2, 50c.; Railroad splices, $1 85; Railroad spikes, $2.25.

CHICAGO PIG IRON MARKET.

Reported for the IRON TRADE REVIEW by Mack & Durkee.

But little change has occurred during the past week, trade continuing to be very light. The deadlock between the Manufacturers' Union and the Molders' Union shows no signs of adjustment yet, and but few foundries are melting any iron. It is generally conceded, however, that there will be a large consumption of iron during the year, and when the labor troubles are finally arranged a great deal of iron will be bought. Prices are held firmly by furnaces, as they realize that under the circumstances it would be unwise to attempt to force iron on to the market, and as there are no large stocks at the furnaces it is giving them an opportunity to catch up on their old orders without accumulating iron to any large extent. We quote as follows:

Lake Superior Charcoal, Nos. 1 and 2, $22 00; Lake Superior Charcoal, Nos. 3, 4 and 5, $23 00; Lake Superior all-ore coke iron, No. 1, $20 00; Lake Superior Cinder mixed coke iron, $19 00; Ohio Blackband Scotch, $21 00; Ohio cinder Scotch, $19 00; Hanging Rock Charcoal, $23 00; Hanging Rock softeners, $20 00; Southern charcoal, $21 00@ ——; Southern coke, No. 1, $19 00; Southern coke, No. 2, $18 00; Virginia brown ore Scotch, $21 00.

LOUISVILLE PIG IRON MARKET.

Reported for the IRON TRADE REVIEW by Geo. H. Hull & Co.

The market for pig iron is in an unsatisfactory condition, and it is difficult to give accurate quotations. The labor trouble still shows a marked influence upon the market, but the prevailing opinion is that this will shortly disappear and that prices will advance. Most producers, therefore, are reasonably firm on figures, and not disposed to press sales. We quote for cash in round lots as below (May 19):

PIG IRON.—Southern Coke, No. 1, Foundry, $17 00@$17 50; Southern Coke, No. 2, Foundry, $16 00@$16 50; Southern Coke, No. 2½, Foundry, $15 50@$16 00; Hanging Rock Coke, No. 1, Foundry, $16 50@$17 00; Hanging Rock Charcoal, No. 1, Foundry, $19 00@$20 00; Southern Charcoal, No. 1, Foundry, $17 50@$18 50; Silver Grey, different grades, $15 00@$16 00; Southern Coke, No. 1, Mill Neutral, $15 00@$15 50; Southern Coke, No. 2, Mill, Neutral, $14 00@$14 50; Southern Coke, No. 1, Mill, Cold Short, $14 50@$15 00; Southern Charcoal, No. 1, Mill, $17 00@$17 50; White and Mottled, different grades, $13 00@$14 00; Southern Car Wheel, Standard Brands, $25 00@$26 00; Southern Car Wheel, other brands, $21 00@$22 00; Hanging Rock, Cold Blast, $25 00@$26 00; Hanging Rock, Warm Blast, $20 00@$21 00.

ST. LOUIS PIG IRON MARKET.

Reported for the IRON TRADE REVIEW by Rogers, Brown & Co., W. H. Shields, Manager.

We have had no end of strikes in this district, but the strikers have almost in every instance gone back at old prices and terms. So far the eight-hour day has been the grand fizzle. The demand has been limited, but prices have been well maintained, sellers realizing that it was useless to make concessions under the circumstances. We quote:

Charcoal Foundry—Missouri, $17 00@18 50; Southern, $18 00@$19 00. Coal and Coke Foundry—No. 1 Southern, $18 50@18 75; No. 2 Southern, $17 50@17 50; Ohio Softeners, $18 00@19 50. Mill Iron—Missouri, 16 00@17 00; Southern, $15 00@16 00. Car Wheel and Malleable—Southern, $20 00@25 00; Lake Superior, $20 00@23 00. Scrap, etc.—Old Car Wheels, $15 00@16 50; Old Rails, $19 00@21 00; Connellsville Coke (East St. Louis) $5 65.

THE Euphrates Valley Railway is being pushed in England just at present. The idea is to help England and Persia, and freeze out Russia.

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BEST WORK.
NICKEL PLATING.
LOWEST PRICES.
106 Canal Street, CLEVELAND, O.

Chagrin Falls & Southern RR.

TIME TABLE.
Went into effect January 1st, 1886.
Standard Time.

Chagrin Falls..lv.	7 00am	9 15am	12 10pm	4 30pm
Collins	7 10	9 25	12 20	4 40
Chamberlins	7 20	9 35	12 30	4 50
Solon.....arrive	7 30	9 45	12 40	5 00
VIA N.Y.P.& B.RR.				
Solon .....leave	7 40	10 15	12 50	6 05
Newburgh	8 05	10 33	1 10	6 20
Cleveland	8 20am	10 50am	1 30pm	6 35pm
Cleveland. leaves	7 00am	8 25am	3 00pm	4 25pm
Newburgh	7 18	8 40	3 15	4 45
Solon.....arrive	7,40	8 56	3 38	5 10
VIA N.Y.,P.& O.RR.				
Solon .....leave	7 45	10 20	3 45	5 15
Chamberlins	7 55	10 30	3 55	5 25
Collins	8 05	10 40	4 05	5 35
Chagrin Falls	8 15am	10 50am	4 15pm	5 45pm

J. W. WILLIAMS, Gen'l Supt.

Scioto Valley Railway

TIME TABLE.
In effect July 19, 1885.
THE SHORT LINE TO ALL POINTS
North and South, East and Southeast, West and Northwest.

TRAINS GOING SOUTH.

STATIONS.	No. 2.	No. 4.	No. 6.
Columbus.....Lv	6 25 a.m	11 45 a.m	5 30 p.m
Valley Crossing	6 48 "	12 08 p.m	5 52 "
Lockbourne	7 00 "	12 20 "	6 06 "
Ashville	7 15 "	12 36 "	6 24 "
Circleville	7 45 "	1 05 "	6 50 "
Kingston	8 08 "	1 32 "	7 13 "
Chillicothe	8 40 "	2 05 "	7 55 "
Sharon	9 22 "	2 47 "	8 43 "
Waverly	9 32 "	2 57 "	8 54 "
Piketon	9 45 "	3 11 "	9 08 "
Big Run	10 08 "	3 28 "	9 25 "
Lucasville	10 25 "	3 46 "	9 45 "
Portsmouth	10 50 "	4 10 "	10 10 "
Sciotoville	11 08 "	4 28 "	10 27 "
Wheelersburg	11 15 "	4 34 "	10 35 "
Haverhill	11 33 "	4 54 "	10 55 "
Hanging Rock	11 50 "	5 05 "	11 05 "
Ironton	12 02 p m	5 17 "	11 17 "
Petersburg	12 15 "	5 30 "	11 30 "
Ashland.....Ar	12 50 p m	6 05 p.m	12 05 a.m

Trains Nos. 2 and 4 daily, except Sunday.
Train No. 6 daily.
Train No. 6 takes supper at Chillicothe.

TRAINS GOING NORTH.

STATIONS.	No. 1.	No. 3.	No. 5.
Ashland.....Lv	2 20 a.m	7 30 a.m	4 55 p.m
Petersburg	2 55 "	8 05 "	5 30 "
Ironton	3 08 "	8 18 "	5 43 "
Hanging Rock	3 20 "	8 30 "	5 55 "
Haverhill	3 31 "	8 41 "	6 06 "
Wheelersburg	3 50 "	9 03 "	6 26 "
Sciotoville	3 56 "	9 10 "	6 31 "
Portsmouth	4 10 "	9 25 "	6 45 "
Lucasville	4 34 "	9 50 "	7 12 "
Big Run	4 51 "	10 08 "	7 31 "
Piketon	5 07 "	10 23 "	7 48 "
Waverly	5 21 "	10 36 "	8 03 "
Sharon	5 32 "	10 47 "	8 15 "
Chillicothe	6 35 "	11 55 "	9 00 "
Kingston	7 04 "	12 22 p.m	9 27 "
Circleville	7 27 "	12 47 "	9 50 "
Ashville	7 55 "	1 12 "	10 13 "
Lockbourne	8 14 "	1 29 "	10 29 "
Valley Crossing	8 26 "	1 43 "	10 43 "
Columbus.....Ar	8 50 a.m	2 05 p.m	11 05 p.m

Train No. 1 daily.
Trains Nos. 3 and 5 daily, except Sunday.

COUPON TICKETS, by the best routes and to all principal points in the United States and Canada, can be found at the following Stations: Columbus, Circleville, Kingston, Chillicothe, Waverly, Portsmouth, Ironton, A. C. & I. Jc., Ashland.

For further information relative to rates, connections and through time, call on your Ticket Agent, or address J. ROBINSON,
JNO. J. ARCHER, Receiver.
Gen'l Pass. & Ticket Ag't, Columbus, Ohio.

Pittsburgh & Lake Erie Railroad.

On and after November 16, 1886, passenger trains will depart from and arrive at the Pittsburgh and Lake Erie Depot at Pittsburgh, as follows, Central time:

P. & L. E. R..R. Depart for—

No. 7, Cleveland, Bradford and East..... 6 30 a.m
No. 5, Buffalo, St. Louis, Cleveland ..... 7 20 a.m
No. 51, Beaver Falls Accommodation..... 8 30 a.m
No. 1, Buffalo, New York, and all New England points.....10 20 a.m
No. 3, Chicago, Cincinnati, St. Louis,...12 55 p.m
No. 9, Buffalo Express..... 3 40 p.m
No. 11, Beaver Falls Accommodation..... 5 50 p.m

Arrive from—

No. 8, Buffalo and Cleveland Night Exp. 5 55 a.m
No. 10, Beaver Falls Accommodation,... 7 28 a.m
No. 2, Youngstown Accommodation,..... 9 10 a.m
No. 12, Chicago, Cincinnati & St. Louis, 12 45 p.m
No. 50, Beaver Falls Accommodation,... 1 35 p.m
No. 6, Buffalo Express,..... 5 10 p.m
No. 4, Cincin., St. Louis and Cleveland, 7 50 p.m

Pit sburgh & Lake Erie trains Nos. 2, 3, 5, 9, and 12 daily.

W. C. QUINCY, General Manager.
R. W. JONES, Master of Transportation.
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ALEXANDER NIMICK, President. GLENDY S. GRAHAM, Secretary. ARTHUR BRITTAN, Manag. & Treas.

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Knobs, Sash Locks and Padlocks,
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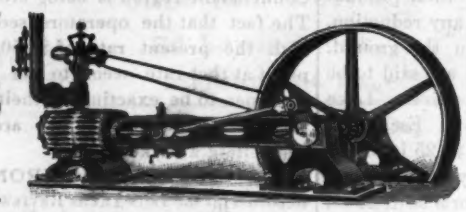

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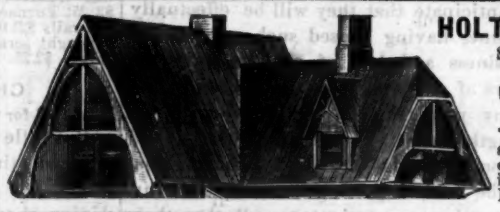
90 THOMAS SHARP & CO., Salem, Ohio.



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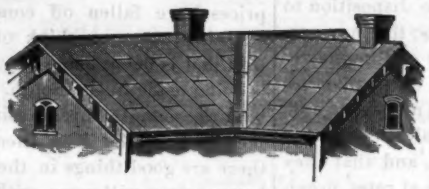

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Iron Frames for Roofs, Buildings, etc.

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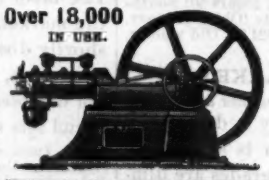
Send for circulars and Price List No. 19.

Over 18,000 IN USE.



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Schleicher, Schumm & Co., {Philadelphia. Chicago.
TWIN ENGINES, ENGINES and PUMPS COMBINED
Sizes: 1 to 25 indicated horse power.
Guaranteed to consume 25 to 75 per cent. less Gas than ANY other Gas Engine Per brake Horse Power

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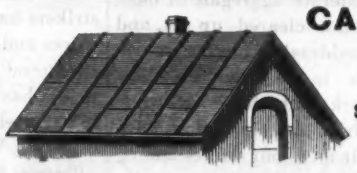

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THE DIRECT ROUTE TO OR FROM
Fort Wayne, Indianapolis, Terre Haute, Evansville, and St. Louis.
13 MILES SHORTER —BETWEEN— 13
Fort Wayne and Indianapolis
Than any other Route.
22 MILES SHORTER AND QUICKER 22
By 3 HOURS, Between
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No change of Cars
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SEWING MACHINE
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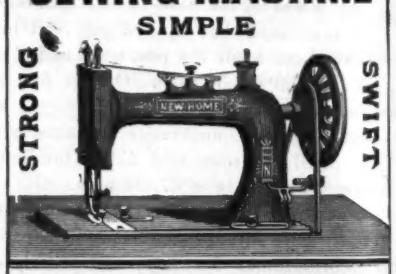

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ORANGE MASS.
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HARDWARE.

Anvils. per lb.
Eagle, American ...10cts dis 20@30&5
Wrights ... 9¾@10
Armitage mouse hole ... 9
Armitage mouse hole extra ... 11½
Wilkinson ... 9½@10c

Anvil Vise and Drill.
Millers Falls Co. $18 ...dis 20
Cheney Anvil and Vise ...dis 25

Augers and Bits.
Snells ...dis 60@60 & 5
Cook's Douglass Mfg. Co ... dis 55
Russell Jennings' augers and bits, ...dis 25
Expansive Bits, Clark's small, $18; large, $26. ...dis35@ 35&5
Hollow Augers, Ives' ... } dis 25 & 10
Hollow Augers, French, Swift & Co ... }
Hollow Augers, Bonney's Adjust. ⅌ doz. $48 ... dis 40&10
Hollow Augers, Stearns' Adjust. ⅌ doz., $48 ...dis 20&10
Gimlet bits ...per gross $3.00 to $3.25
Holtz Bit Stock Drills ...dis 25&10
Ship Augers ...dis 15@20

Awl Hafts.
Sewing, brass ferrule, ...⅌ gross $3.50, dis 40&10
patent sewing, short ...⅌ doz $1.00, dis 40&10
Patent sewing, long ...$1.20 ⅌doz net
Patent peg, plain top, ..$10.00 ⅌ gro., dis 45&10
Pat. peg, leather top. ...$12.00 ⅌ gro., dis 45&10

Awls, Brad Sets, &c.
Awls, Sewing, Common ...⅌ gross $1.70—dis 35
Awls, Shouldered Peg ⅌ gross 2.45—dis 40@40&10
Awls, Patent Peg ...⅌ gross 63c—dis 40@40&10
Awls, Shouldered Brad ...$2.70 ⅌ gross—dis 35
Awls handled brad ...$7.50 ⅌ gro dis 45
Awls handled, scratch ...$7.50 ⅌ gro dis 35&10
Awls, socket scratch ...$1.50 ⅌ doz dis 25@30
Brad Sets, No. 42, $10.50; No. 43, $12.50 ...dis 70&10&5
Brad Sets, Stanley's Excelsior, No. 1. $7.50 ...dis 30&10

Axes.
Best grades ...⅌ doz $6.50 to $7.00
Special Brands ... 5.50@6.00

Axle Grease.
Frazier's, in bulk ...keg ⅌lb 5c; pail 6c net
Frazier's, per gross ...$9 00@$9.50
Mica Axle Grease ... $8.50 per gross
Mica Axle Grease in bulk ... 4c per lb

Axles.
Nos. 1 to 6 ...dis 3¾, short bed 4½
Nos. 7 to 18 ... dis 60&5@60 10
Nos. 19 to 22 ...dis 70&5

Bag Holders.
Sprengle's pat., ⅌ doz $18 ...dis 60

Balances.
Spring balances ... dis 50
Common 24lb ...⅌doz $1.50 dis 50

Bells.
Hand, light Brass ... dis 75&10
Hand, Extra Heavy ...dis65& 10 to 70
Hand, White Metal ...dis70@70&5
Hand, Silver Chime ... dis 25&10&5
Hand, Globe (Cone's Patent). ...dis 25&10
Gong, Abbe's ... dis 25&10@35
Gong, Yankee ... dis 40&10
Gong, Barton's ... dis 40&10@50
Pull, western ...dis 25&10
Cow, common, wrought ... 60&10
Cow, western ... Sargent's List 70&10
Call ...dis 40@40&5
Farm bells ... ⅌lb 2¾@3c
Steel alloy, church and school ...dis 40

Bellows. Discount.
Blacksmith's ... 50&10@60
Moulders, ...discount 50@50 & 5
Hand, ...discount 50@50 & 5

Belting, Rubber.
Standard ...dis 70&5@70&10
Extra ...dis 60@60&10
N. Y. Belting & Packing Co. standard.. dis 60&10
N. Y. Belting & P'king extra standard dis 50&10
Cleveland Rubber Co., extra standard...dis 60&10
Extra 5 dis on all for Cash.

Bench Stops.
Hotchkiss's ⅌ doz $5.00 ... dis 10@10&10
Weston's ⅌ doz No. 1, $10.00; No 2, $9 dis 25&10&5
McGill's ...⅌ doz $3.00 dis 10
Morrill's ... ⅌ doz ... $9.00 dis 50

Bit Holders.
Extension, Barber's ...⅌ doz $15 00, dis 40&5
Diagonal ...⅌doz $24.00 dis 40
Angular ... ⅌ doz $24 00, dis 40&5

Blind Adjusters.
Domestic ...⅌ doz $3.00dis 33⅓
Excelsior ...⅌ doz $10.00 dis 50 and 10 and 2

Blind Fasteners.
Mackrell's ...⅌ doz. pairs, $1,00—dis 20@20&10
Van Sand's Screw Pattern $15 ⅌ gross—dis 50&10
Van Sand's Old Pattern ...$15 ⅌ gross—dis 50&10
Washburn's Old Pattern ...$9.00 ⅌ gross, net
Merriman's ...new list, net
Salisbury & Austin No, 2008 ...$9.00 ⅌ gross, net
Security Gravity ...$9.00 ⅌ gross, net

Blind Staples.
Barbed ½ inch and larger ... ⅌ lb8@8½c net
Barbed ⅜ inch ... ⅌ lb 9@9½c net

Blocks.
Tackle blocks,&c.,list April 17, 1885..dis 50@50&5
Reed Mfg. Co. self-lubricating ...dis 50

Bolts.
Cast iron barrel bolts ... 70 to 70&5
Cast Iron shutter bolts, etc ... 70 to 70&5
Cast iron chain bolts ... 65&10
Ives patent door bolts ... 55
Wr't iron barrel bolts ... 70 to 70&5
Wrought iron square bolts ... 70 to 70&5
Wrought shutter bolts ... 60&10
Sargent's list
Carriage com. new list ... 75&10&5to80&5
Tire, common, new list ... 65&10
Carriage and tire, Philadelphia pattern 75&10@75&10&5
Stove bolts ... 70
Plow bolts ... 65
Machine ... 75&10&5
Bolt Ends ...dis 75&10&5@80

Borax.
⅌ lb ... 8½c@9c

Boring Machines.

Without augers.	Upright	Angular
Douglas	5 50	6 75 dis 50
Snell's, Rice's patent	5 50	6 75 dis 40&10&10
Jennings	5 50	6 75 dis 45@45&10
Other machines	2 50	3 00 ...net
Phillips, with augers	7 00	7 50, ...net

Bow Pins.
Humason, Beckley & Co.'s, Nos. 1 and 2 dis 60 and 10@60 and 10 and 5
Humason, Beckley & Co.'s other Nos. dis 70@70 and 10
Sargent & Co.'s ...$17 and $18, dis 60 and 10
Peck, Stow & W. Co dis 50 and 10@50 and 10 and 5

Braces.
Q. S. Backus ... discount 60&5@60&10
Barber's ...discount 50
Spofford's Patent ...discount 50&10
Common Ball, American ... 8½ in $1.30-10 in$1.50
Bartholomew'sNos. 25, 27, 30 dis 50&10@50&10&10
Bartholomew's Nos. 117, 118, 119 ...dis 65@65&5
Amidon's Barker's imp'd ... dis 60@10&5
Amidon's corner brace ...dis 40@40&10
Universal ...8 inch $1.90; 10 inch $2.10
Buffalo Ball ...8 inch $1.35@$1.40

Brackets.
Shelf, plain, Sargent's list ...55&10
Fancy " " ...dis 60&10
Reading, plain ...dis 60&10
Reading, rosette ...dis 65&10

Bright Wire Goods.
Regular List ... 75&10

Broilers,—Henis' self basting.

Inch	9	10	9x11
Per doz	$4 50	5 50	6 50

Buckets, Galvanized.
Hill's ⅌ doz ... 12qt 3 50 ...14qt 4 50
Iron clad 14 qt $8 ... dis 00

Bull Rings.
Union Nut Co ...dis 55
Sargent's ...dis 66⅔&10
Hotchkiss' low list ...dis 30
Humason, Beckley & Co.'s ...dis 70&10
Peck, Stow & W. Co.'s ...dis 50&10
Ellrich Hardware Co., white metal low list dis 50

Butts. Discount
Wrought brass ... 75&10&10
Cast brass, loose joint ...33⅓&10to33⅓&10&10
Cast Iron—
Fast joint, narrow ...60&5@60&10&5
Fast joint, broad ...60&5 to 60&10&5
Loose joint ...70@70&10&5
Loose joint, jap ...70@70&10&5
Loose joint, jap. with acorns ...70@70&10&5
Loose pin, acorns ...70@70&10&5
Loose pin, japanned acorns ...70@70&10&5
Loose pin,acorns,japanned,platedtips70@70&10&5
Wrought iron—
Wrought, fast joint narrow ... 65&2
Wrought, fast joint broad ... 65&2
Wro't loose joint broad ... 65&5&2
Table Butts, back flaps, etc ... 65&2
Regular inside blind ... 65&2
Light inside blind ... 65&2
Loose pin ... 65&5&2
Light loose pin ... dis 65&2
Gem spring hinges ... 30
Blind butts, Parker ...dis 75&2
Blind butts, Palmer ...dis 50&5&10
Blind butts, Seymour ...dis 70&2
Blind butts, Lull & Porter ...dis 80&10
Blind butts, Nicholson ...dis 45&10
Blind butts, Huffer ...dis 50
Blind butts, Clark's Nos. 1, 3, 5 ...dis80&5@80&10
Blind butts, Manhattan Hardware Co ...dis
Blind butts, Sargent Nos. 1, 3 ...dis 75&10
Blind butts, Sargent's No. 12 ...dis 75&10&10
Blind butts, Reading's Gravity ...dis 75&10
Blind butts, Shepard's "Noiseless" Nos. 50 60, 65, 45, 55 ...dis 75&10@80
Blind butts, Shepard's Champion Gravity, No 75 ...dis 80&5&5
Blind butts, Shepard's "Gravity," Nos. 1. 3 and 5 ...dis 80
North's automatic blind fixtures, No. 2 for wood, $9 00; No. 3 for brick, $10 50
Shepard's "O.S" and "Acme," Lull & Porter ...dis 75&10&5
Shepard's "Queen City" reversible ...dis 75&10
Clark's imp'd shutter hinge, Nos. 0, 1, 1½, 2, 2½, 3 ...dis 70

Butcher's Cleavers.
Humason & Beckley Mfg. Co ...dis 30&5@30&10
Bradley's ...dis 25@30
Beatty's ...dis 33⅓&5

1	2	3	4	5	6	7	8
$16 50	19 00	21 50	24 00	27 00	30 00	33 50	36 50

New Haven Edge Tool Co.'s ...dis 40
Albertson Mfg. Co ...dis 33⅓@33⅓&5

Can Openers.
Sprague No. 1 $2.00, 2 $2.25, 3 $2.50, dis60@60&10
Universal ...⅌ doz $3 00, dis 35&5
Domestic ...⅌ doz $2 50, dis 45
Champion ...⅌ doz $2 00, dis 50

Caps—Percussion, ⅌ 1000.
Hicks & Goldmark's } dis. 25to25&5
F. L. Waterproof, 1-10's ...50c
E. B. Trimmed Edge, 1-10's ...65c
E. B. Ground Edge, Cent. Fire, 1-10's 70c
Double Waterproof, 1-10's ...1.40
Musket Waterproof, 1-10's ...50c
G. D. ... 28
Elys waterproof central fire ...$1.60

Cartridges.
Rim fire ...discount 60&2
Pistol and rifle ...discount 40&2
Military and sporting ...discount 30&2

Cards.
Horse and Curry ... dis 10@10&10
Cotton ...new list, Aug., 1883, dis 10
Wool ...new list, Aug., 1883, dis 10

Carpet Stretchers.
Cast steel, polished ...⅌ doz $ 3.25
Cast iron, steel points ...⅌
Sockets ...⅌ doz
Bullard's ... dis25@25&10

Cattle Leaders.
Humason, Beckley & Co.'s ...dis 75
Sargent's ...dis 66⅔&10
Hotchkiss ...dis 30
Peck, Stow & W. Co ...dis 50&10

Carpet Sweepers.
Queen ...⅌ doz $16.00
Mystic ...⅌ doz $17
Cottage ...⅌ doz $15
Queen, with band ...⅌ doz $18
King ...⅌ doz $30
Garland ...⅌ doz $19

Casters.
Bed ... }
Plate ... } dis 60@60&5
Shallow Socket ... }
Deep Socket ...dis 45 to 50
Yale Casters, list May, 1884. ...dis 25&10@25&10&5
Martin's patent ...dis 45&10 to 50
Payson's Anti-friction ... dis 60

Chains.
Trace, 6½-10-2 ...⅌ pair 79c }
Trace, 6½-10-3 ...⅌ pair 70c } dis 50&10to50&10&5
Trace, 7-10-2 ...⅌ pair 86c }
German Halter Chain, list June, 1884, dis55&5@60
German Coil, list of June, 1881 ...dis55&5@60
Galvanized Pump Chain ...⅌ lb 5½ to 6c

Jack Chain, Iron ...75@75&10
Jack Chain, Brass ...dis 75@75&10

Chalk.
White ...⅌ gross 55c
White Crayon ...⅌gross 12@12½

Chisels.
Socket Framing and Frmer ...dis 75@80
Socket Framing and Firmer, Buck, Bros ...dis 30
Socket Firmer & Framing, L. & I. J. White ... dis 25 & 5
Tanged Firmers ...dis 50 to 50&5

Clamps.
Snow's adjustable, iron ... dis 40&5
Hammer's adjustable, iron ... dis 15
Sargent's cabinet, iron ... dis 66⅔&10

Clips.
Axle and spring bar, Norway iron ... dis 65&2
Wrought-Iron felloe clips ...⅌ lb. 5½c
Steel felloe clips ...⅌ lb. 5c

Cockeyes.
discount ...50

Coal Vases.
Buffalo Palace, S. S. & Co ...dis 33⅓&10&10
Buffalo Common, S. S. & Co ...dis 33⅓&10&10

Cocks, Brass.
Racking ...dis 65&10@70
Globe ... dis 65&10@70
Plain Bibbs ... dis 60&10@60&10&5
Ale and Beer ... dis 60&10@60&10&5

Coffee Mills.
Enterprise ...20 & 10@30

Compasses, Dividers, &c.
Compasses ... dis 60&10&10@70
Calipers ... dis 60&10&10@70
Dividers ... dis 60&10&10@70
Bemis & Call Co.'s Dividers ...dis 60&5
Bemis & Call Co.'s Compasses & Calipers..dis 50&5
Bemis & Call Co.'s Wing & Inside or Outside ...dis 50&5
Bemis & Call Co.'s Double ...dis 60
Bemis & Call Co.'s (Call's Patent Inside) ...dis 30
Excelsior ...dis 50
Cook's Extension ...dis 20@20 &5
J. Stevens & Co.'s Calipers and Dividers ...dis 25&10

Coopers' Tools.
Bradley's ... discount 20
Barton's ...discount 20 to 20&5
L. & I. J. White ...20 & 5

Corkscrews.
Humason, Beckley Mfg. Co ...dis 40
Clough's patent ...dis 33⅓@33⅓&5
Howe Bros. & Hulbert ...dis 35

Corn Knives.
Corn knives, Bradleys ...dis 10

Cradles.
Grain ...dis 40&5&2

Crowbars.
Cast steel ...⅌ lb 3¾
Iron, steel points ... 3¼@3½

Curry Combs.
Fitch's ...dis 50&10@50&10&5
Rubber ...⅌ doz. $10.00, dis 25@30

Curtain Pins.
Silvered glass ...net
White enamel ...net

Cutlery.
Beaver Falls ...dis 33⅓
Goodell table ...dis35@ 40

Dog Collars.
Embossed gilt ... dis 30&10
Leather ...dis 40

Door Springs.
Torrey's Rod, regular size ...⅌ doz $1.45 to $1.50
Gem (Coil);
No. 1, Large Japanned ...⅌ doz. $4.00 }
No. 2, Medium Japanned ..⅌ doz 2.75 } dis 50&10
No. 3, Small Japanned ...⅌ doz 2.00 }
Japanned and coppered ...dis 60
Galvanized and nickel plated ...dis 50
No. 4, Screen Door size ...⅌ doz. 1.50
No. 5, Screen Door size, ...⅌ doz. 2.00
No. 6, Medium ...⅌ doz. 2.75
No. 7, Large ...⅌ doz. 4.00

Drawing Knives.
Douglass & Witherby ...dis75@75&10
Merrill ...dis 60&10&10
L. & I. J. White ...dis 20 & 5
Adjustable handle ... dis 20 to25

Drills and Drill Stocks.
Blacksmiths' each ... 1.60@1.70
Blacksmiths' self-feeding, each ...$7.50 discount 20
Breast, P. S. & W ...discount 40 & 10
Breast, Millers Falls ...each, $3.00 discount 25
Ratchet, Weston's ... 20@25
Automatic Boring Tools ...each, $1.75 to $1.85

Drill Chucks.
Morse's Beach Patent ...each, $8.00, discount 20
Morse's Adjustable ...each, $7.00, dis 20 to 20&5

Dripping Pans.
Buffalo, S. S. & Co ...⅌ lb. 5@5¼c

Egg Beaters.
Dover ...per doz. $2.50
Acme ... per gross $8.00

Emery.
Regular numbers ...⅌ lb 7c
Flour and F. F ...⅌ lb 6½c
For emery paper and cloth, see sand paper.

Escutcheon Pins.
Iron ...dis 50&10
Brass ...50&10

Escutcheons.
Door Lock ...Same discounts as Door Locks
Brass Thread ...dis 60 to 60&10
Wood ...dis 25

Faucets.
Frary's Patent Petroleum ... dis 40 &10&2
Cork Lined ...dis 70 to 70&10
Self-measuring, Enterprise, per doz $36 dis 20&10

Felloe Plates.
⅌ lb ... 6½c net.

Fly Traps.
Paragon ...⅌ doz $2 00

Files.
J. & Riley Carr, new list April 1, 1883 ...dis 15
J. & Riley Carr horse rasps ...dis 10
Best files of domestic make, according to brand ...dis 55&10@55&10&5
Lower grade domestic files ...dis 60&10&10&70
Heller's horse shoe rasp ...dis 50&10

Forks
Hay, Manure and Spading. listdis 60&10&5@60&10
Phila list ...60@60&5

Fruit and Jelly Presses.
Enterprise Mfg. Co ...dis 20&10@33⅓

Fry Pans.
Central Stamping Co.'s list ...dis 33⅓&2

No	0	1	2	3	4	5	6	7	8
⅌ doz.	$1 50	1 75	2 00	2 25	2 50	2 75	3 25	3 75	4 25

S. S. & Co ...dis 40&2
"Acme" ...dis 60

Fluting Scissors.
Discount ...45

Fluting Machines.
Eagle 3½-inch ...$2.15, dis 35
Geneva Hand Fluter, White Metal.. ⅌ doz. 12.00 ...dis 25
Shepard hand, Nos. 85 $15.30, 95 $8, 110 $11 dis 40
Knox, 4½ inch rolls ...$3 25 each } dis 35
Knox, 6 inch rolls ...$3 60 each }
Crown, 4½ in. $3 50; 6-in. $4 00; 8-in. $6 50 each ...dis 35
Crown Jewel ...6-in. $3 50 each, dis 35
American, 5-in. $3; 6-in. $3 40; 7-in. $4 50 each ...dis 35
Crown hand fluter, Nos. 1 $15; 2, $12 50; 3, $10 ⅌ doz ...dis 30

Gauges.
Marking ...dis 60&10
Wire ...dis 10&10
Wire, Wheeler, Madden & Co ...dis 10

Gimlets.
Nail and Spike ...dis 50&10 & 5
"Eureka" Gimlets ...dis 40&10
"Diamond" Gimlets ...dis 40&10
Double Cut, Shepardson's ...dis 45
Double Cut, Ives' ...dis 50
Double Cut, Douglass' ...dis 40
"Bee" ...⅌ gross $12, dis 25

Glue Pots.
Tin enameled ... dis 30@30&
Family, Howe's ... dis 4

Grindstone Fixtures.
Sargent's ... dis 70&10

Gun Wads.
U. M. C. & W. R. A.—B. E., 11up ...2 00 }
U. M. C. & W. R. A.—B. E., 9&10 ... 2 30 }
U. M. C. & W. R. A.—B. E., 7&8 ... 2 60 }
U. M. C. & W. R. A.—P. E., 11up ... 3 10 } dis 20&2
U. M. C. & W. R. A.—P. E., 9&10 ... 4 00 }
U. M. C. & W. R. A.—P. E., 7&8 ... 4 90 }
Eley's B. E., 11 up ...1 75
Eley's P. E., 11@20 ...2 80

Hack Saws.
Griffin's Hack Saws, complete ...dis 40&10
Griffin's Hack Saw, Blades only ...dis 40&10
Star Hack Saws and Blades ...dis 25

Halters.
Covert's patent ½ jute ... dis 50&10&2
Covert's hemp horse and cattle ties... dis 50&10&2
Covert's jute horse and cattle ties ...dis 60&2
Meneely's pat adjustable hemp and jute..dis 50&10
Meneely's hemp and jute horse and cattle ties ...dis 50&10

Hammers.
Maydole's ...discount 25@25 &10
Cheney's new list, Dec 1, 1885 ...dis 20&10
Buffalo Hammer Co ...dis 30@35
Magnetic Tack, No. 1, 2, 3, $1.25, $1.50 and $1.75, dis 25&10
Heavy hammers and sledges ...dis 60&10

Hand Cuffs and Leg Irons.
Providence Tool Co, hand cuffs, $15 ⅌ doz...dis 10
Providence Tool Co., leg irons $25 ⅌ doz ...dis 10
Tower's ...dis 25
Daley's improved hand cuffs; 2 hands, polished, ⅌ doz. $48; Nickeled, $57; 3 hands polished, ⅌ doz $72; Nickeled, $84 ...dis 20

Handles—
Door or Thumb Latches.

Per doz Nos.	0	1	2	3	4	
Sargent's	90	1 00	1 18	1 35	1 50	dis 60&10 & 10

Roggin's Latches ...⅌ doz. 30@35c
Bronze Iron Drop Latches ... ⅌ doz. 70c net
Jap'd stove door handles—Nuts, $1 62; Plate $1 10; no plate $0 88 ...net
Barn door ...⅌ doz $1 40, dis 10&10
Wrought chest ...dis 70
Surface chest ...dis 70
Flush chest ...dis 70
Lifting ...dis 70
Saw and plane ...dis 40&10
Hammer and hatchet ...dis 35@35&5
Brad awl ...⅌ gross $2 00
Hickory firmer chisel, assort ...⅌ gross $4 50 }
Hickory firmer chisel, large ...⅌ gross $5 00 }
Apple firmer chisel, assorted ...⅌ gross $5 00 } dis 40
Apple firmer chisel, large ...⅌ gross $6 00 }
Socket firmer chisel, assorted ...⅌ gross $3 00 }
Socket framing chisel, assort ...⅌ gross $5 00 }
File, assorted ...⅌ gross $2 75 }
Auger, assorted ...⅌ gross $5 00 } dis 40 @40&10
Auger, large ...⅌ gross $7 00 }

Hangers.
Barn Door, old patterns ... dis 60&10 &10
Barn Door, New England ... dis 60&10&10
Climax (Anti-Friction) ...dis 55
Zenith Anti-Friction Wood Track ...dis 55
Reed's Steel Arm ...dis 40
Challenge ...dis 50
"Champion" Medina Mfg. Co ...dis 60
Sterling Improved (Anti-friction) ...dis 65&10
Victor, No. 1, $15; No.2, $16.50; No. 3, $18.. dis50&
Cherritree ...dis 50 &
Kidder's ...dis 50&10@50&10
U. S ...4 in., $12; 5 in., $15, dis 60&10
The "Boss" ...dis 60
Terry's Patent 5 in.. 12.00; 3½ in., 10.00, dis 40&5 @40&10
Cronk No. 4, 12.00; No. 5, 14.40; No. 6, 18.00 ...dis 50&5@50&10
Architect ...⅌ set 6.00, dis 20
Eclipse ...dis 20&10
Felix ...⅌ set 4.50, dis 20
Hamilton Wrought ...dis50@50&10

Harness Snaps
German, old list ...dis 75
Meneely's Pat. Safety new list ...dis60&10
Covert, New Patent, new list ... dis 50&2

Hay Knives.
Lightning ...per doz. $18 dis 20
Electric ... ⅌ doz $10@12.00

Hinges.
Wrought Strap and T Hinges ... 65&5&2
Screw, hook and strap, 8 10 12 in ...3½@4
14 to 36 in ... 2½@3
Screw hook & eye hinges...½ ⅌ doz 1.50 }
⅝ 2.45 } ...dis 10
¾ 3.30 }
Gate, western ...⅌ doz $4 40, dis 55
Gate, N. E ...⅌ doz $7 00, dis 55
Gate, N. E. reversible ...⅌ doz $5 20, dis 55
Gate, Clark's, Nos. 1, 2, 3 ...dis 60&10&2
Gate, N. Y. State ...⅌ doz $5 00, dis 55
Gate, automatic ...⅌ doz $12 50, dis 50
Gate, common sense ...⅌ doz pair $4 50, dis 50
Gate, Seymour's ...dis 45&10
Am. Spring Hinge Co ... 30

Hollow-Ware.
Stove Hollow Ware, Ground ...dis 50&5@50&10
Enameled and Tinned Hollow-Ware
Kettles ... dis 50&10
Oval Boilers, Saucepans ...dis 30@35
Gray Enameled Ware ...dis 40@40&5
Rustless Hollow-Ware ...dis 50@50&5
Galvanized Tea-Kettles

Inch	6	7	8	9
Each	5	60	65	75

TRAVELERS' REGISTER.

[Standard Time.]

Lake Shore & Michigan Southern Railroad.

TRAINS GOING EAST.	Arrive from West.	Depart East.
No. 4, Fast Limited Ex.....	*2 55 a m	*3 05 a m
No. 8, N. Y., B'f'n & At. Ex	*8 25 a m	*8 50 a m
No. 26, Elyria Accom.....	†7 45 a m	.....
No. 24, Toledo & Buffalo Accom. via Sandusky.....	†10 30 a m	†10 50 a m
No. 24, Toledo Accommodation via Norwalk.....	†10 30 a m	†10 50 a m
No. 12, N. Y. & Bos. Ft. Ex.	*2 10 p m	*2 45 p m
No. 14, Special N. Y. Exp.	p m	3 00 p m
No. 2, Night Ex. via Norw'k	9 40 p m	†10 00 p m
No 26, Conneaut Accom.....		†4 25 p m

TRAINS GOING WEST.	Arrive from East.	Depart West.
No. 1, Fast Limited Ex.....	*12 15 a m	*12 25 a m
No. 23, Mich. Ex. via Sand'y	*2 15 a m	
No. 3, Chi. Ex. via Sand'y..	†6 00 a m	†6 30 a m
No. 25, Mich. Ac. via Norw'k	.....	†6 30 a m
No. 21, Toledo Ex. via Norwalk and Sandusky.....	†12 50 p m	†3 20 p m
No. 5, Fast St. Louis & Chicago Ex. via Sandusky.....	10 50 a m	*11 00 a m
No. 9, Chi. Pac. Ex. via Nor'k	*6 15 p m	*6 40 p m
No. 31, Elyria Accommodation, to Elyria only.....		†4 30 p m
No. 27, Conneaut Accom.....	†8 10 a m	.....

Sunday train for Nottingham—Depart 8:15 a. m. and 1:45 p. m.; returning, leave Nottingham at 8:50 a. m. and 3:45 p. m.

Reference marks—*Daily. †Daily except Sunday. ‡Daily except Monday.

A local Cleveland and New York Sleeper daily on No. 12, leaving Cleveland at 2:45 p m, arrives Grand Central Depot, New York, 10:30 a. m.

For further information as to trains and connections apply at the Union Ticket Office, corner Bank and Superior-sts., under Merchants' Bank.

Cleveland, Columbus, Cincinnati & Indianapolis.

DEPARTURE

No. 3, Col. Cin. & Ind. Ex	7 00 A. M
No. 5, Col., Cin. Ind. and St L. Ex.....	*10 55 A. M
No. 9, Col., Cin., Ind. and St. Louis Ex.*	7 00 P. M
No. 23, Grafton & Wheeling Ex	6 45 A. M
No. 27, Columbus Accommodation	3 30 P. M
No. 29, Massillon and Uhrichville Ex.....	4 10 P. M

ARRIVALS.

No. 2, Col., Cin. Ind and Mattoon Ex....	9 50 P. M
No. 4, Col., Cin. & St. Louis & Ind. Ex *	2 55 A. M
No. 8, Col., Cin., Ind. and St. Louis Ex.	*7 30 A. M
No. 24, St. Louis, Ind. & Col. Ex.....	*2 25 P. M
No. 22, Massillon and Uhrichville Ex....	10 00 A. M
No. 20, Galion Accommodation.....	9 00 A. M
No. 12, Columbus and Cincinnati Ex...	*2 35 P. M
No. 26, Wheeling Express.....	6 35 P. M

*Daily, all other trains daily except Sunday.

Cleveland & Pittsburg.

	DEPART.	ARRIVE.
Mail.....	7 50 a m	1 00 p m
New York Express.....	2 10 p m	6 25 p m
Alliance Accommodation.....	3 45 p m	10 10 a m
Ravenna Accommodation...	4 50 p m	8 15 a m
Night Express.....	11 10 p m	6 00 a m
Newburg Accommodation...	10 15 a m	11 30 a m
Newburg Accommodation...	12 10 p m	1 30 p m

Train leaving at 2 10 p m has Pullman Buffet Sleeper from Cleveland to New York without change.

New York, Pennsylvania and Ohio.

	ARRIVE.	DEPART.
N. Y. & Pitts. Express.....	†6 10 a m	*8 25 a m
N. Y. & Pitts. Express.....	*6 35 p m	†11 10 p m
Fast N. Y. & Pitts. Express..	*10 50 a m	*3 00 p m
Mahoning Accommodation...		†7 00 a m
Pittsburgh Local Express...	† 10 40 p m	
Youngstown Local.....	†8 20 a m	
Mahoning div. and Pitts Local		*12 05 p m
Mahoning Val Accom.....		*4 25 p m
Pittsburgh accomodation.....	*1 30 p m	

* Daily. † Daily except Sunday. ‡ Daily except Monday.

Cleveland and Canton Railroad.

Arrive.—Canton, Sherrodsville and Coshocton 10 00 a.m., 6 50 p.m.
Kent —*7 50 a.m., 10 00 a.m., 6 50 p.m.
Bedford—6:00 a.m., *7:50 a.m., 10:00 a.m., 1:05 p.m., 6 40 p.m., 6 50 p.m.
Newburgh and Miles avenue—6-00 a.m., *7:10 a.m., *7:50 a.m., 10:00 a.m., 1 05 p.m., 4:25, p.m. 6:40 p.m., 6.50 p.m., 9:25 p.m.
Depart—
Canton, Sher'dsville & Cosh't'n—7:00 a.m. and 3:10 p.m.
Kent—7:00 a.m., 3:10 p.m., *6:00 p.m.
Bedford—7.00 a.m., 11:10 a.m., 3:10 p.m., 4:50 p.m., *6:00 p.m., 10:35 p.m.
Newburgh and Miles Avenue—6:12 a.m., 7:00. a.m., 11:10 a.m., 2:00 p.m., 3:10 p.m., 4:50 p.m., *6:00 p.m., 8:10 p.m., 10:35 p.m.
Zanesville, Newark, etc., 7:00 a.m., 3:10 p. m.
Theater train leaves Cleveland at 10:35 p.m., and runs through to Bedford.
Trains marked with * run daily. All others daily except Sunday.
Depot at Ontario street, opposite Huron street

N. Y. C. & St. L. R'y.—"The Nickel Plate."

EASTWARD.	ARRIVE.	DEPART.
Buffalo Passenger.....	10 40 a m	10 45 a m
Chicago Passenger	9 00 p m	.....
Local Freight.....	4 40 p m	5 45 a m

WESTWARD.	ARRIVE.	DEPART.
Chicago Passenger.....	.....	6 45 a m
Postoria Passenger.....	4 46 p m	4 51 p m
Local Freight.....	5 00 p m	5 50 a m

Rocky River Accommodation departs 7 40 a. m.; 1 35 p. m.
Euclid Accommodation departs 6:24 a. m., :10 a. m., 5:05 p. m.
All trains daily, except Sunday.

Valley Railway.

	ARRIVE.
From Canton	10 10 a m
From Canton, Pittsburg and intermediate points	2 00 p m
From Valley Junc., Canton & Akron.	5 50 p m
	DEPART.
To Akron, Canton and Marietta.....	8 20 a m
To Mahoning Valley points.....	2 25 p m
To Akron, Canton & Valley Junc.....	5 00 p m

*Daily. †Daily except Sunday.
Trains leave depot, South Water Street.

Cleveland, Lorain and Wheeling.

	DEPART.	ARRIVE.
Wheeling Express.....	6 45 a m	6 35 p m
Uhrichsville Express.....	4 10 p m	10 00 a m

Engineers' Specialties. The Crescent Lubricating Compound and Automatic Grease Cups will effect a saving of 75 per cent. over oil. Investigate their merits. CRESCENT MF'G. CO., CLEVELAND, O.
24

The Neptune and Posidon Injectors

None more Reliable.
None Easier to take Apart.
None Cheaper.
Will work either under pressure or Lift.
Can be Adjusted over 60 per cent,
Will work under very low as well as high pressure.
For further particulars and prices Address
MARTY & WINC, 20 Blackstone Building, CLEVELAND, OHIO.

A. TEACHOUT & CO.

JOBBERS OF
Doors, Glazed Windows, Glass, Blinds, Mouldings, &c.
42, 44 and 46 Michigan St., Cleveland, O 27 and 29 West Spring St., Columbus, O.

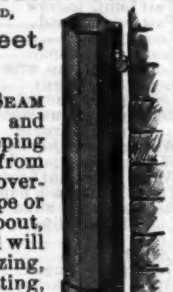
W. R. EYNON,

Manufacturer of
Milling Machines, Die Sinking Machines, Universal Heads, INDEX CENTRES, VISES,
and other Special Tools.
63 Center Street, CLEVELAND, O.

IF YOU WANT
Hand Fire Grenades
SEND FOR THE
Manhattan.
THEY ARE NOT MADE OF CAST IRON and filled with salt water, but of
Frail Glass and filled with a Chemical
hat will do its work always and without fail.
IT IS THE ONLY PRACTICAL HAND FIRE GRENADE IN THE WORLD.
For further particulars and prices address
Frank Gray, Gen'l Agt.
116 Wooster Street,
81-3m NEW YORK CITY.

ECLIPSE ELECTROTYPE AND ENGRAVING CO. 147 ST. CLAIR ST. CLEVELAND, OHIO. ANDREWS & AUST PROPS.

THE IRWIN & REBER
PATENT
EXPANDING WATER CONDUCTOR.
MANUFACTURED BY THE
S. S. S. Conductor Co.
LIMITED,
163 Lacock Street,
ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

Made in 6 foot lengths of a single sheet of
SOFT STEEL,
Galvanized, Kalamined or Leaded.

L. M. PITKIN, Pres't and Treas. F. L. CHAMBERLIN Sec'y.
Variety Iron Works Comp'y
BOILER MAKERS,
Machinists and Founders
Shafts, Pulleys and Hangers a Specialty.
51 to 73 Scranton Ave. 21 Cleveland, O

Payne's Patent
Low Pressure Safety Valve.

The accompanying cut shows WALTER S. PAYNE & CO.'S PATENT
Low Pressure Safety Valve
FOR STEAM HEATING BOILERS.
NO LEVER OR WEIGHT EXPOSED to be tampered with by children.
Put in the number of weights required to carry the amount of steam desired, and screw on the top. This top acts as a guide for the rod of the Valve, so it will ALWAYS *Seat Squarely.*
CAN BE REPAIRED BY TAKING OUT THE ACORN IN TOP OF COVER.
Send for Circular and Price Lists.
Walter S. Payne & Co., FOSTORIA, OHIO.
Mention this paper. 21

AMERICAN
FOUNDRY PRACTICE.
Treating of
Loam, Dry Sand and Green Sand Moulding,
And Containing
A Practical Treatise upon the Management of Cupolas and the Melting of Iron.
By THOMAS D. WEST,
Practical Iron Moulder and Foundry Foreman.
Fully Illustrated.

TABLE OF CONTENTS:

The Moulder and the Foundry:—The Moulder and His Trade—Learning the Moulder's Trade—Building a Foundry.

Green Sand Moulding:—Moulding and Casting Fly-wheels—Surface and Bottom of Green Sand Moulds—Moulding Large and Small Pulleys—Finishing Green Sand Moulds—Moulding Bevel and Spur Wheels in Green Sand without a Pattern—Improvement in Moulding Gear Wheels, Pulleys, etc.—Venting Green Sand Moulds—Moulding Kettles with a Dry Sand Cope and Green Sand Bottom—Dropping of Green Sand Copes—Moulding Kettles in Green Sand without a Pattern—Casting Large Pipes in Green Sand—Ramming up the Teeth of Gear Wheels in Green Sand—Making and Venting Beds—Method of making a Heavy Green Sand Casting—Iron and Wooden Flasks—Skimming and Flow-off Gates—Making a Green Sand Basin, Runners and Gates—Weighting Down Copes—Damp Foundry Floors—One Hundred Items that Apprentices should Know and Remember.

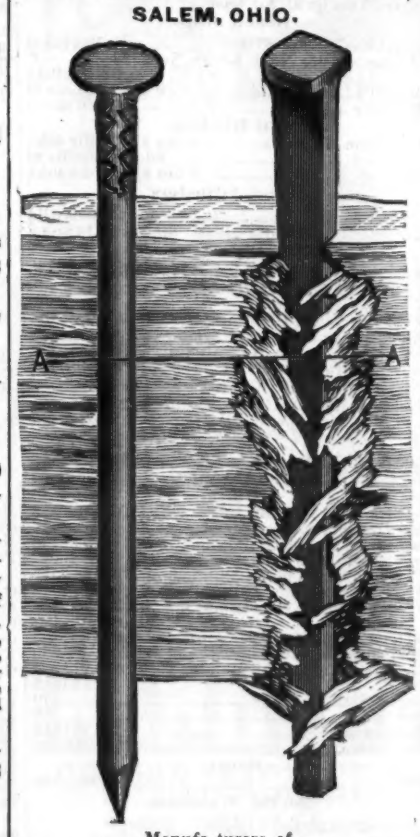
Loam and Dry Sand Moulding:—Building and Firing large Ovens—Ovens for Drying small Cores—Two Ways of Moulding Crooked Pipes in Loam—Moulding large Quarter-turn Pipes in Loam—Moulding Kettles in Loam—Casting Anvil Blocks—Sweeping an Octagonal Loam Mould—Building or Laying Bricks for Loam Moulds—Venting Loam and Dry Sand Moulds—Moulding Rolls and Making Roll Flasks—The Surface of a Loam Mould—Sweeps and Spindles—Moulding Gear Wheels in Dry Sand or with Cores—Making Return, Elbow, Branch, and T-pipe Core Arbors—Making Hay Rope Loam Cores—Blacking and Sleeking Loam and Dry Sand Moulds—Iron Casings for Moulding Pots in Loam—Drying Moulds—Chaplets and their Use—Leaving Risers Open or Closed on Loam or Dry Sand Moulds—Reservoirs and Ladles for Pouring Heavy Castings—Scabbing of Green Sand, Dry Sand, and Loam Moulds.

Manipulation of Iron Castings:—Contraction and Cracking of Castings—Feeding and Shrinkage of Melted Iron—Burning or Mending Heavy Castings—Chilled Cast-iron Castings—Making Chilled Castings Smooth—Splitting Pulleys and Other Castings—Straightening Crooked Castings—Cast Iron—Mixing and Melting Iron—Iron Mixtures—Odd Ways of Melting Iron—The Tuyeres and Lining of a Cupola—Preparing Cupolas—Fuel and Charging Iron—Tapping Out and Stopping Up Cupolas—Air Furnaces.

Notes and Receipts:—Blacking Mixtures—Loam Mixtures—Dry Sand Mixtures—Core Sand Mixtures—Green Sand Facings—Cleaning Castings—Weights of Castings.

Sent by mail, postage paid, on receipt of price, $2.50. DAY & CARTER,
130 Water street, CLEVELAND, O.

The Salem Wire Nail Co.,
SALEM, OHIO.



Manufacturers of
WIRE and WIRE NAILS
HEADQUARTERS FOR PENNY WIRE NAILS.

Hoes.

Garden, mortar,.....dis 60&10&5@60&10&10
Planter's, cot,.....dis 60&10&5@60&10&10
Magic.....℔ doz $4.75
Grub.....dis 60@60&10

Hog Rings and Ringers.

Perfect rings..... .....℔ doz boxes $1.75@$2
Perfect ringers.....℔ doz $2.50
Blair hog ringers.....℔ doz $

Hoisting Apparatus.

"Moore's" hand hoist, with lock brake .....dis 15
"Moore's differential pulley block.....dis 20

Hooks.

Bird Cage, Sargent's list.....dis 60&10&10
Belt.....dis 80@80&10
Clothes Line Sargent's list..... dis 66⅔&10
Ceiling Sargent's list..... dis 60&10
Coat and Hat, Sargent's list .....dis 60&10
Wire Coat and Hat, Gem.....dis 45
Wrought Staples and Hooks & Staples.....dis80&10@80&20
Wire Screw Hooks and Screw Eyes. dis 75&10@75&10&5
Hooks and Eyes—Malleable Iron..... dis 70
Hooks and Eyes—Brass.....dis 60&10&10

Horse Nails.

	No. 10	9	8	7	6	5	
Ausable, ℔ lb.....	23	24	25	26	28	31	dis25&10
Putnam, ℔ lb.....	19	20	21	22	24	27	dis 5 & 7

Horse Shoes.

Burden at factory.....℔ keg $3.75
R. I. Horse Shoe Co., Perkins' Imp. at factory.....℔ keg $3 75
Walker's forged .....℔ keg $3 75
Mule Shoes, at factory.....℔ keg $4.75

Hose, Rubber.

dis.....75@75&5
N. Y. Belting & Packing Co. standard dis 60@60&5

Ice Awls, Chisels, &c.

American Ice Chisel Pol'd.....℔ doz. $3.00, dis 20

Ice Cream Freezers.

Buffalo champion, S. S. & Co.....dis 60&2

Ice Tongs.

Champion .....℔ doz $4.00, dis 25&10
Family.....℔ doz $2.75, dis 20@25

Jack Screws.

Millers Falls list.....dis 50

Kettles.

Brass, 7 to 17 inches inclusive.....℔ lb 22c. net.
Brass larger than 17 inches.....℔ lb 24c. net.
Enameled and Tea Kettles.....See Hollow Ware

Keys.

Eagle, cabinet, trunk and padlock.....dis 40 and 2

Knives.

Ames' Butcher.....dis 25
Ames' Shoe Knives..... dis 20@25

Knobs.

Carriage, Japanned.....℔ gross 80c. dis 60&10
Base, Rubber Tip.....dis 70&10&5
Hemetite Door Knobs, new list.....dis 35&5@35&10
Door Mineral..... } Same discounts as
Door Por. Jap'd } Door Locks.
Door Por. Plat'd }
Door Por..... }
Shutter, Porcelain.....dis 65&10

Ladles.

Melting, Sargent's.....dis 55&10
Melting, Reading.....dis 35&10
Melting, Monroe's Patent.....℔ doz $4.00, dis 40
Melting, P. S. & W .....dis 35@35&10

Lanterns

Tubular Standard No. 0.....℔ doz 6.75@7.00
" " " 1..... " 8.25@8.50
Guards for tubulars adds 25 cents per doz.
Tubular, Lift Wire, No. 0, ℔ doz.....8.50
Tubular, Lift Wire, No. 1, ℔ doz.....10.00
Police, Small, $6.00; Med., $7.25; Large. $9.75.....dis10@15

Lemon Squeezers.

Porcelain lined.....℔ doz $6 00, dis 25&30
Wood.....℔ doz $3 00, dis 35
Eureka, tinned .....℔ doz $8 00, dis 10
Dunlap's improved.....℔ doz $3 75, dis 20
Sammis'.....No. 1, $5; 2, $6, 12, $18 ℔ doz dis25&10
Townsend's patent.....$6 00 ℔ doz dis 33⅓
Jennings' "Star" ..... doz $2 50
The "Boss"..... ℔ doz $2.50
Dean's No. 1, ℔ doz $6 50; 2, $3 25; 3, $1 90...dis 55
Little giant.....dis 50
Acme.....℔ gross $55 00, dis 50

Lines.

Cotton Chalk.....dis 55
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No, 3, $7.50 ℔ gross .....dis 25
Masons' Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50 Net
Masons' Colored Cotton.....dis 45
Wire Clothes, No 18, $3.25; No 19, $2.75; No. 20 $2.50;.....

Locks, Bolts, etc.

[Nimick & Brittan Manufacturing Co., Pittsburgh].

Discount Sheet No. 8 [March 10, 1886].

Door locks, knobs and latches.....dis 45
Escutcheons and keys.....dis 45
Sash locks.....dis 55
Padlocks and padlock keys.....dis 75
Bell pulls, mineral, porcelain and jet.....dis 40
Bell pulls, bronze plated..... .....dis 40
Bell pulls, Egyptian bronze.....dis 40
Bell pulls, genuine bronze.....dis 50
Lever bell pulls, genuine bronze.....dis 55
Butts, genuine bronze.....dis 60
Butts, bronze plated.....dis 70
Butts, Egyptian bronzed.....dis 70
Store door locks and latches.....dis 60
Store door handles.....dis 60
Shutter hinges and flaps, genuine bronze.....dis 60
Shutter hinges, bronze plated.....dis 75
Shutter hinges, Egyptian bronzed.....dis 75
Shutter flaps, bronze plated.....dis 60
Shutter flaps, Egyptian bronzed.....dis 60
Parliament butts, genuine bronze.....dis 60
Parliament butts, bronze plated.....dis 75
Parliament butts, Egyptian bronzed .....dis 75
Flush bolts, genuine bronze.....dis 60
Flush bolts, bronze plated.....dis 75
Flush bolts, Egyptian bronzed.....dis 75
Shutter knobs, genuine bronze.....dis 60
Shutter knobs, bronze plated.....dis 70
Shutter knobs, Egyptian bronzed .....dis 60
Shutter bars, genuine bronze.....dis 60
Shutter bars, bronze plated .....dis 70
Shutter bars, Egyptian bronzed .....dis 70
Sash lifts, genuine bronze .....dis 50
Sash lifts, bronze plated..... .....dis 70
Sash lifts, Egyptian bronzed.....dis 70
Sash pulls and plates, genuine bronze.....dis 60
Push plates, genuine bronze.....dis 60
Drawer pulls, genuine bronze.....dis 50
Drawer pulls, bronze plated .....dis 70
Drawer pulls, Egyptian bronzed.....dis 70
Letter box plates, genuine bronze.....dis 50
Letter box plates, bronze plated.....dis 60
Letter box plates, Egyptian bronzed .....dis 60
Scales.....dis 40
Thumb latches, Egyptian bronzed.....dis 75
Barn door locks .....dis 33⅓

Lumber Tools.

Ring peavies, "Blue Line" finish.....℔ doz $20 00
Ring peavies, common finish.....℔ doz $18 00
Steel socket peavies.....℔ doz $21 00
Mall. iron socket peavies.....℔ doz $19 00
Cant hooks, "Blue Line" finish.....℔ doz $16 00
Cant hooks, common finish.....℔ doz $14 00
Cant hook's mall. socket clasp, "Blue Line" finish.....℔ doz $16 00
Cant hooks, mall. socket clasp, common finish.....℔ doz $14 50
Cant hooks, clip clasp, "Blue Line" fin. ℔ doz $14
Cant hooks, clip clasp, common finish...℔ doz $12
Hand spikes.....℔ doz 6 ft., $15 00; 8 ft., $20 00
Pike poles, pike and hook—

	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
℔ doz,.....	$11.50	$12 50	$14 50	$17 50	$21 50
Pike poles, pike only, ℔ doz.....	$10 00	$11 00	$13 00	$16 00	$20 00
Pike poles, not ironed, ℔ doz.....	$6 00	$7 00	$9 00	$12 00	$16 00

Setting poles, doz 14 00 $15 00 $17 00
Swamp hooks .....℔ doz $18 00
Landing blocks.....℔ doz $22 50
Skidding tongs.....℔ doz $51 00
Log binders.....℔ doz $26 00
Bended boot calks, 1 to 5 M, dis 25; 5 to 10 M, dis 30
Square steel boot calks.....dis 40
Chain rafting dogs.....℔ 100 $12 50
Ring rafting dogs..℔ 100, med., $10 00; large $12 00
Timber grapples.....℔ doz $30 00

Mallets.

Hickory .....dis 20&10
Lignumvitæ.....dis 20&10
Penfield Block Co., Lignumvitæ and Hickory.....dis 30@30&10

Mattocks.

Regular list.....dis 60@60&10

Meat Cutters.

Dixon's (P.S.&W.)	1	2	3	4	
℔ doz.	$14.00	$17.00	$19.00	$30.00	dis 45 @45&5

Draw Cut	Nos. 5	2	6	8	10	
Each.....	$50.00	$75.00	$80.00	$225.00	400.00	dis 20

Woodruff's (P S & W) per doz No 100 No 150 $15 $18dis 45
Hale's—Nos. 11 12 13 [@45&5
$27 $33 $45 dis60&10&10@70

Mincing Knives.

Am. (2d quality), ℔ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's .....dis 20&10
Smith's, ℔ doz. single, $2 00; double, $3 00 dis 40@45
Cowles Hardware Co.....dis 50@10@60

Money Drawers.

℔ doz.....$18 00

Molasses Gates.

Stebbins' pat'..... dis 70&10@75&5
Stebbins' genuine ..... dis 66⅔&10
Stebbins' tinned ends.....dis 40&10
Chase's hard metal .....dis 50&10
Bush's.....dis 20
Lincoln's pattern.....dis 66⅔&100
Weed's .....dis 20&10
Boss Nos.... 1 2 3 4
$7 00 8 00 9 00 10 00 ℔ doz. dis 60&10&10

Nails.

Wire Nails .....See trade report

Nuts and Washers.

Square nuts ⅜ and smaller, ...9½c off list
Square nuts, 7-16 and larger,.....8½c off list
Hexagon nuts, ⅜ and smaller.....10½ off list
Hexagon nuts, 7-19 and larger, ...9½ off list
Washers, ⅜ and 7-16 smallers.....9¾c off list
Washers, 7-16 and larger .....8¾ off list
In lots less than 100 lbs., ℔ lb add ½c to list, 1 lb boxes 1c to list.

Nut Crackers.

Table (Humason & Beckley Mfg. Co.).....dis 40
Blake's pattern.....℔ doz. $2 00, dis 10
Turner & Seymour Mfg. Co.....dis 50

Oakum.

Government..... ℔ lb 7c
U. S. Navy.....℔ lb 6½c
Navy .....℔ lb 5½c

Oilers.

Zinc and Tin..... dis65&5@70
Brass and Copper.....dis 50&10
Malleable (Hammer's), No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ℔ doz.....dis 10@ 10&10

Packing, Steam.

N. Y. Belting & Packing Co .....dis 50@50&10
American Packing.....10@11c
Russia Packing.....14c
Italian Packing.....14@15c
Cotton Packing .....15@18c

Pencils.

Faber's Carpenters' .....high list, dis 50
Faber's Round Gilt.....℔ gro $5.25 net
Dixon's Lead.....℔ gro $4.50 net
Dixon's Lumber.....℔ gro $6.75 net
Dixon's Carpenter's.....dis 40&10

Picks.

Railroad, 5 to 6 lbs.....$11 dis 60&10
... .. 6 to 7 lbs.....$12 dis 60&10

Pinking Irons.

℔ doz .....65c. net

Picture Nails.

Brass head, Sargent's list..... } dis 50&10&10
Brass head, combination list.....dis 50&10
Porcelain head Sargent's list, dis.....50&10&10
Porcelain head, combination list.....dis 40&10

Plane Irons.

L. & I. J. White.....dis 25

Pliers and Nippers.

Button's Patent .....dis 30&10@40
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21 00 ℔ doz. .....dis 20&10@33⅓
Gas Pliers.....dis 60
P. S. & W. Cast Steel .....dis 50
P. S. & W. Tinners' Cutting Nippers add 6 per cent. dis 10

Plumbs and Levels.

Standard list.....dis 70&10@70&10&10
Disston's.....dis 45&10
Pocket levels.....dis 70&10@70 &10&10
Davis' inclinometers.....dis 10&10

Post Hole and Tree Augers.

Samson Post Hole Digger..℔ doz. $36.00, dis 20&10
Fletcher Post Hole Augers ....℔ doz. $36.00, dis 20
Eureka Diggers.....℔ doz. $16 00 @ $17.00
Leed's..... per doz $8.50 @ 9
Vaughan's Hollow Tube Post Hole.....$24.00 dis30⅓@20&10&10

Potato Parers.

White Mountain.....℔ doz $5.00@$5.50
Ant'rim Combination.....℔ doz $8.00
Hoosier .....℔ doz $13.50

Pruning Hooks and Shears.

Disston's Combined Pruning Hook and Saw ℔ doz $18.00.....dis 20&10
Disston's Pruning Hook.....℔ doz $12.00 dis 20&10
E. S. Lee & Co.'s Pruner.....dis 40
Pruning Shears .....℔ doz 3.75@$4.00 net

Pulleys.

Hot House .....discount 66⅔&10
Japanned Screw.....discount 66⅔&10
Brass Screw.....discount 70&10
Japanned Side.....discount 66⅔&10
Japanned Clothes Line.....discount 60&10

Pumps.

Cistern, best makers.....dis 50
Pitcher spout, best makers.....dis 60
Pitcher spout, cheaper goods.....dis 70@70&10

Punches.

Saddlers' or Drive.....℔ doz. good quality, 65@70c
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5
Bemis & Call Co.'s Springfield Socket.....dis 50&5
Solid Tinners.....℔ doz. $1.44, dis 55

Rails.

Sliding Door, Wrought Brass...℔ lb 35c dis 20@25
Sliding Door, Iron, Painted℔ foot 4c dis 20&10&5

Rakes.

Cast Steel.....dis60&10@60&10&10
Malleable .....dis 60&10@60&10&10

Razors.

J. R. Torrey Razor Co.....dis 20
Westenholme & Butcher..... $10 @ £...dis 10

Rivets.

Iron, in bulk.....discount 45
Copper.....discount 60&5@60&10

Rivet Sets.

dis 50&10

Rods.

Stair, Brass.....dis 25&5
Stair Black Walnut.....50c ℔ doz.

Rollers.

Barn door, Sargent's list, ... dis 60&10&10
Acme (Anti-Friction).....dis 55
Union barn door roller .....dis 70

Rope.

Manufacturer's list Feb. 6, 1886.. dis 1c@1¼ ℔ lb
Manilla.....⅝ inch ℔ lb 13
Manilla.....¾ and 5-16 inch ℔ lb 13½
Sisal.....½ and larger .....per lb 9
" .....⅜.....per lb 9½
" .....¼ & 5-16..... per lb 10

Rules.

Boxwood..... ..... discount 80&10

Sad Iron.

From 4 to 10 lbs at factory...per 100 lbs $2.25@2.50
Self-heating.....℔ doz $9 net
Self-Heating, Tailor's.....℔ doz $18 net
Gleason's Shield and Toilet.....discount 25
Mrs. Potts's Irons, double pointed.....dis 40@40&5
Mrs. Potts's Irons, square back.....dis 40@40&5
Enterprise Star Irons.....discount 40
Cem. Fluter and Sad Iron...℔ doz $15, discount 15

Sash Weights.

Per ton $20

Saws.

Disston's Circular.....discount 45&10
Disston's hand panel, rip &c.....discount 20&10
W. M. & C., Champion Regular.....per foot 26c
W. M. & C., " Thin Back.....℔ ft 29 c

Saw Frames.

White, Vermont.....℔ doz $1.50, dis 25&10
Red, polished and varnished.....℔ doz $1.50, dis 10
Saw rods.....$10 list dis 10&10

Saw Sets.

Aiken's Genuine.....$13.00, dis 50 &10
Morrill Saw Sets No. 1 $15.00; No. 3 and 4 $24.00 .....dis 40 &10

Scales.

Hatch, Counter, No. 171.....℔ doz $42.00, dis 50&10
Hatch, Tea, No. 161.....℔ doz $15.00, dis 50&10
Chatillon's Grocers .....dis 50
Family Turnbulls.....dis 30@30&10
Scale Beams, List of January 12, 1882 dis 60&5@60&10

Scrapers.

Adjustable Box Scraper (S. R. & L. Co.) $6.50.....dis 20&10
Box, 1 Handle.....℔ doz $4.00, dis 10
Foot.....dis 50&10@60

Screen Corners.

Porter's pat. window and door frame.....dis33⅓
Screen corner irons, Warner's.....dis 33⅓

Screw Drivers.

Stanley R. & L. Co.'s Varnished Handles dis 60&10
Stanley R. & L. Co.'s Black Handles.....dis 50&10
Sets Interchangeable.....℔ doz $18.00 dis 25

Screws.

Wood Screws—List Feb 15, 1886.
Flat head iron.....dis 60&10
Round head iron.....dis 50&10
Flat head brass.....dis 75
Round head brass.....dis 70
Flat head bronze 75
Round head bronze.....70
Machine, flat head, iron.....dis 60
Machine, round head, iron 55
Bench and hand—
Bench, iron .....55&10@55&10&10
Bench, wood, beech, per dozen $2.25.....
Bench, wood, hickory.....20 & 10
Hand, wood.....25&10@25&10&5
Lag or coach.....dis 75 & 10@80
Coach, patent gimlet point..... 75@75&5
Bed.....25&5
Hand rail, Sargent's.....66⅔&10
Hand rail, Humason, Beckley & Co.'s.....70
Hand rail, Am Screw Co.....70

Shears.

American (Cast) Iron.....dis75&10@75&10 & 5
Pruning .....See Pruning Hooks and Shears
Barnard's Lamb Trimmers.....℔ doz $3.75
Tinners'.....dis 20&2
Heinsch's List, Dec. 1881.....dis 60 &10
Heinsch's Tailor's Shears.....dis 33⅓

Shovels and Spades.

Ames' list Nov 1 1885..... .....discount 20
Griffith's black iron.....dis 50&10
Griffith's steel .....dis 60@60&5
Griffith's solid cast steel R.R. goods.....dis 20

Scroll Saws.

Lester, complete, $10.00.....dis 25
Rogers, complete, $4.00. .....dis 25

Tap Borers.

Common and Ring..... dis 20&10
Ives' Tap Borers.....Nos. 1, 2, 4—dis 15&10
Ives' Tap Borers.....Nos. 13, 14—dis 25&10
Enterprise Mfg Co.....dis 20&10

Sheaves.

Sliding Door M. W. & Co.....list dis45&2
Sliding Door R. & E. list Dec 18, 1885... dis 60&2
Sliding Door, Patent Roller.....dis 60&10&2
Sliding Door, Pat'nt Roller, Hatfield's.....dis 70
Sliding Door, Russell's Anti-Friction Dec. 18, 1886 dis 60&2
Sliding Door, Moore's Anti-Friction .....dis 60
Sliding Shutter, R. & E. list..... dis 60&10&2
Sliding Shutter, Sargent's list.....dis 60&10&10
Sliding Shutter, Reading list.....dis 60&10&10
Moore's Anti-Friction.....New list, dis 60

Ship Tools.

L. & I. J. White.....dis 20 & 5

Shovels and Tongs.

Iron and Brass Head, R. & E. list dis 60&10&5@60&10&10
Iron and Brass Head, P. S. & W dis 60&10&5@60&10&10

Sieves.

Buffalo metallic, S. S. & Co., new list.....dis 50&20
Barler's flour sifters .....℔ doz $2 5

Slates.

School, by case.....dis 45@5

Spoke Shaves.

Iron.....dis 45
Wood .....dis 30

Spoke Trimmers.

Bonney's.....℔ doz $10.00 dis 50
Stearns'.....℔ doz $9.00 dis 50 &10

Spoons.

Basting Spoons ..... dis 33⅓&2
Britannia.....dis60&10@60&10&10
Wm. Rogers Mfg Co.....dis 50&10@60
H & E Silver Co. Steel Silver Plated, tea $15.00. Tables $30.00.....dis 50@50&10
Tin .....dis 10@20

Squares.

Steel and iron .....} dis 70&5@70&10&5
Nickel plated.....} dis 70&5@70&10&5
Try square and T bevels.....dis 60&10
Disston's try square and T bevels.....dis 45&10
Winterbottom's try and miter.....dis 20&10

Steelyards.

dis 40&10@50&5

Stocks and Dies.

Blacksmith's .....dis 30@30&5
"Lightining" screw plate .....dis 10&10@25

Stone.

Hindostan, No. 1, 3¼c; Axe, 4¼c; Ships 5½c
Sand Stone.....℔ lb. 2½c
Washita Stone .....No. 1, ℔ lb 20
Turkey Oil Stone.....4 to 8 in.....℔ lb 60c
Turkey Slips.....$2.00 ℔ lb
Lake Superior.....℔ lb 17c
Lake Superior Slips .....℔ lb 31@32c
Washita Slips No 1.....℔ lb 14
Washita No 2 stone.....℔ lb 16c
Arkansas Stone .....1 45@1 50

Stove Boards.

Buffalo zinc, S. S. & Co.....dis 50

Stove Polish.

Joseph Dixon's.....℔ gross $6 00 dis 10
Gem .....℔ gross 4 50 dis 10
Gold medal.....℔ gross 6 00 dis 25
"Mirror".....℔ gross 6 00 dis —
Lustro.....℔ gross $4 75 net
Ruby.....℔ gross $3 75 net
Rising Sun.....℔ gross $5 75 net
Dixon's plumbago .....℔ lb 8c. net
Boynton's Noon Day, ℔ gro, ... $5 00;

Trowels.

Lothrops' Brick and Plastering.....dis 20&10
Reed's Brick and Plastering..... .....dis 15
Disston's Brick and Plastering..... ....dis 20&10
Brade's brick..... dis 25

Tacks, Brads, &c.

New List, September 1, 1882. & Supplement Jan. 1, 1886.

American iron carpet tacks all kinds..dis 55
Steel carpet tacks all kinds.....50
Swedes Iron carpet tacks all kinds.....50
Swedes iron tacks.....50
Swedes iron Upholsterers' tacks.....50
Tinned Swedes iron tacks 50
Tinned Swedes iron Upholsterers' tacks...50
American iron cut tacks.....50
Copper tacks 50
Copper finishing and trunk nails.....50
Cigar box nails.....45
Finishing nails. 45
Hungarian nails and miners' tacks.....35
Gimp and lace tacks.....45
" " tinned.....45
Trunk and clout nails 37½
Tinned trunk and clout nails.....37½
Basket nails.....37½
Chair nails.....37½
Common and patent brads.....45
Tinned capped trunk nails 30
Looking-glass tacks 25
Picture frame points 25
Leathered carpet tacks.....25
Brush tacks.....25
Shoe finders'.....List Jan 1, 1886
Lining and saddle nails .....List Jan 1, 1886

Quotations are at present entirely nominal.

Tapes, Measuring.

American.....dis 25&10
Spring .....dis 40
Chesterman's .....Regular list, dis 25@35

Tinners' Shears, &c.

Shears and snips (P. S. & W.) .....dis 20@ 25
Snips, J. Mallinson & Co..... dis 30⅓

Tinware.

Stamped, Central Stamping Co.'s list.....dis 30&2
Japanned, Central Stamping Co.'s list.....dis 33&2
Pieced, Central Stamping Co..... ..... dis 30&2
Pieced S. S. & Co.....dis 60
Japanned S. S. & Co.....dis 25&10
Stamped, S. S. & Co new list..... .....dis 33&2

Extras sometimes given.

Triers.

Butter and Cheese.....dis 25

20-Inch Lever Drill.

especially made for Agricultural work. This machine has 1 5-16 inch spindle gear to one has 4 change on cone. All gears and racks cut from the solid, fitted for Morse taper No. 2; is a first class tool.

Price $75 00, Send for Catalogue to

W. P. DAVIS,
24 North Bloomfield, N.

EDWARDS, TOWNSEND & CO.

Wholesale Grocers,

AND DEALERS IN

Wines, Liquors and Cigars,

Teas a Specialty.

NOS. 151 & 153 WATER ST.,

CLEVELAND, O.

Cleveland & Marietta R. R.

New Through Line Between the Ohio River and the Great Lakes.

The popular line to Chicago, St. Paul, Milwaukee, Minneapolis, and all points in the Great Northwest. Direct connection for the Pennsylvania Oil Fields and all points East and Southeast. December 6, 1885.

GOING NORTH. Exp. No. 2	GOING NORTH. Exp. No. 4	STATIONS.	GOING SOUTH. Exp. No. 3	GOING SOUTH. Exp. No. 1
am	pm		pm	pm
6 20	2 30	lv.....Marietta.....ar.	7 20	12 50
s6 43	2 56	.....Stanley.....	6 52	12 23
7 06	3 20	.....Warner.....	6 29	11 58
7 25	3 42	.....Macksburg.....	6 10	11 38
7 32	3 50	.....Dexter City.....	6 02	11 30
7 53	4 11	.....Caldwell.....	5 40	11 04
8 28	4 45	.....Mt. Pleasant.....	5 05	10 19
8 38	4 55	.....Byesville.....	4 55	10 02
8 50	5 10	.....Cambridge.....ar.	4 30	9 45
9 47	6 20	.....New Comerstown.....	3 27	8 47
10 28	6 55	.....Canal Dover.....	2 38	8 00
	pm			am
10 51	7 20	.....Valley Junction.....lv	2 12	7 35
am	am		pm	pm
		.....Valley Junction.....	11 48	8 35
11 39	7 58	.....Canton.....	10 58	7 52
pm	.....		am	pm
12 33	8 54	.....Akron.....	10 00	7 00
pm	am		am	pm
1 50	10 15	lv.....Cleveland.....ar.	8 35	5 40
pm	pm			
8 00	6 20	.....Buffalo.....		
pm	pm		pm	
1 10	10 05	.....Orrville.....	12 20	6 00
				am
1 55	10 45	.....Creston.....lv	11 50	5 30
2 40	11 28	.....Wellington.....	11 00	8 10
	am			
3 27	12 10	.....Norwalk.....	10 13	7 12
3 44	12 25	.....Monroeville.....	10 00	7 02
			am	pm
5 55	5 20	.....Toledo.....	7 50	5 00
pm	p m			
12 35	11 5	.....Columbus.....	.....	.....
am	am			
5 40	8 5	.....Chicago.....	.....	.....
pm	am			
‖3 30	6 00	.....Pittsburgh.....	.....	.....
am	pm			
7 00	6 55	.....New York.....	.....	.....

NO. 17. ACCOMMODATION.

	a.m		a.m
Cambridge.....	6 30	Macksburg.....	9 00
Byesville.....	6 55	Warner.....	9 30
Pt. Pleasant.....	7 15	Stanley.....	10 02
Caldwell.....	8 17	Marietta.....	10 35
Dexter City.....	8 47		

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Connections made with all lines at junction points for all important cities east and west.

A. T. WIKOFF, Receiver.

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Purchase your Tickets

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RAILWAY.

The Great Trunk Line

—TO THE—

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The only line from CLEVELAND with no change of cars to the

MISSISSIPPI RIVER.

SOLID TRAINS and THROUGH SLEEPERS to

ST. LOUIS,

Where direct connections are made in UNION DEPOT for all points WEST.

Practically no change of Cars to the

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The Only Line to

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with complete through Train Service, making direct connections in UNION DEPOTS for all points in the

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TOURIST TICKETS

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FAST EXPRESS TRAINS DAILY,

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A PERFECT ROADBED.

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173 Superior Street, Cleveland, Ohio.

D. JAY COLLVER, Passenger Agent. J. D. BROWN, Ticket Agent.

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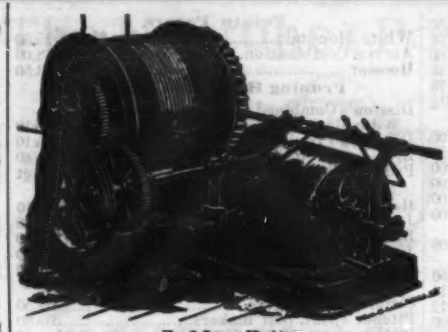

Fig. 2 Screw Hoisting.

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Elevators.

L. S. GRAVES & SON,

Cor. Center and Frank Streets,

Rochester, N. Y.

New York Office, 46 Cortland Street.

Send for our Catalogue.

Worswick Mfg. Co.

MANUFACTURERS OF

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AND BRASS GOODS.

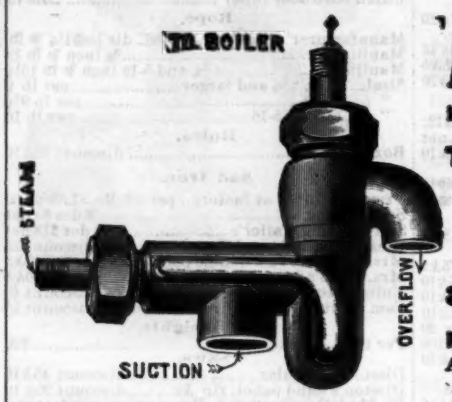
Jobbers of Plumbers', Gas and Steam Fitters' Tools and Supplies.

SOLE MANUFACTURERS OF

THE WORSWICK PATENT RADIATORS.

AGENTS FOR IRON PIPE AND BOILER TUBES.

Cor. Water and St. Clair Streets, 22 CLEVELAND, O.



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Automatic Inspirator

is acknowledged by all the leading mechanics and manufacturers to be

The Simplest,
The most Positive,
And most Perfect

IN USE. UNSURPASSED FOR

Stationary and Portable Engines.

Send for Catalogue and Price List.

MORSE AUTOMATIC INSPIRATOR CO.

Address all correspondence,

132 Bank Street, Cleveland, O

CRIMPED & CORRUGATED

IRON ROOFING,

SIDING, CEILING, METAL SHINGLES.

W.G.HYNDMAN & CO.

SEND FOR CIRCULAR & PRICES CINCINNATI, O.

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MANUFACTURERS OF

Presses and Dies

And Special Machinery

For working all Shapes and Classes of Sheet Metal.

DOUBLE SEAMING MACHINES

For Round, Square and Oval Cans.

HAND AND POWER

CIRCULAR SHEARS.

Foot and Power

Squaring Shears.

WORKS:

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17 Adams Street,

Brooklyn, N. Y.

Buchanan Manufacturing Co.,

Manufacturers of

SASH WEIGHTS,

Cast Washers. Farm Bells,

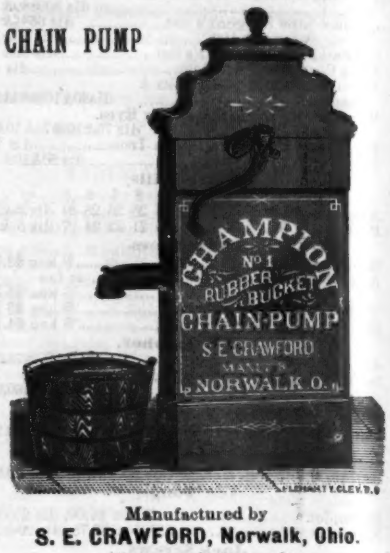
And General Castings.

Telephone 2151.

176 Central Way. CLEVELAND, OHIO.

CHAMPION RUBBER BUCKET

CHAIN PUMP



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S. E. CRAWFORD, Norwalk, Ohio.

Also manufacturer of

CHAIN PUMP PIPE BUCKETS,

Common and Expansion.

Also Dealer in Steel Chain—best quality.

Can also furnish Wood Force Pumps

at very low figures. Special inducements to parties ordering Car lots. Correspondence solicited.

S. E. Crawford. 6m70

MACHINERY FOR

Straightening & Cutting Wire

Of all Sizes to any Length.

Send for Catalogue.

JNO. ADT & SON,

New Haven, Conn., U. S. A.

R. M. McBETH & CO.,

181 West Pearl St.,

Cincinnati Ohio

Manufacturers of

20-INCH

Upright Drills,

with lever or wheel feed.

ALSO THE CELEBRATED

"ACME"

Foot Lathe.

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HIGH ARM

DAVIS

Vertical Feed Sewing Machine.

It has no equal

for range of work Ease of operation or mechanical construction. **Agents Wanted** in unoccupied territory. Address

Davis Sewing Machine Co.

Cleveland, Chicago, Watertown, N. Y.

Tobacco Cutters.

Enterprise Mfg. Co. (Champion)...... dis 20&10@30

Transom Lifters.

Wollensak's Patent........ dis 50

Traps.

Game, Newhouse........dis 35
Wood, mouse........15c ℔ doz holes
Delusion, mouse........℔ gross $18 00 dis 15

Twine. BC. P.

No. 12, Flax Twine, ¼ and ½ lb Balls...22c 24c
No. 18, " " ¼ and ½ " ...20c 22c
No. 36, " " ¼ and ½ " ...19c 21c
No. 264, Mattrass ¼ and ½ 50c
Chalk Line, Cotton, ½ lb Balls........28c
Mason Line, Linen, ⅛ 60c
2-Ply Hemp, ¼ and ½ lb Balls (Spring Twine) 14½
3-Ply " 1 lb Balls........15c
3-Ply " 1½ lb Balls........13c
Cotton Wrapping, 5 Balls to lb........14@20c

Vises.

Solid box........50 &10@60
Parker's........discount 20@25
Prentiss........" 25@25 &5
Stephen's........" 25
Saw Filers, Wentworth's........dis20&10
Saw filers, Stearn's........dis 40

Washer Cutters.

Smith's Patent........℔ doz $12 00, dis 20&10&10
Johnson's........℔ doz $11 00, dis 33⅓
Penny's......℔ doz Pol. $14 00; Jap'd. $16 00, dis 55
Appleton's........℔ doz $16 00, dis 60&10
Bonney's........dis 30&10

Well Wheels.

8 in., $1.85; 10 in., $2.15; 12 in., $2.90

Wire. New List Jan. 18, 1884

Brass and Copper........discount 33⅓@30&10
Bright and annealed, Nos. 0 @ 18........dis 70
" " Nos. 19 @ 26........dis 67½
" " Nos. 27 @ 36........dis 72½
Coppered Nos. 0 to 18, market list........dis 65 & 5
Galvanized Nos. 0 to 18, market list........dis 60&5
Tinned market No. 0@18........dis 60&5
Cast steel........dis 50
Tinned Broom Wire........dis 60
Annealed Fence, Nos. 8 and 9........dis 65
Annealed Grape, Nos. 10 to 14........dis 65
Fence Staples........℔ lb 3½
Fence Staples, galvanized........℔ lb 4½
Stubs Steel Wire regular........$6 00.@lb dis 30
Barb Wire, galvanized........℔ lb 4⅞@5

Wrenches.

Coe's genuine, cash in 10 days........60 & 3
Girard Standard........discount 70@10
Agricultural........discount 80@80&5
Mechanics'........dis 60&10 & 3
American adjustable........dis 45
Coes' pattern, malleable........dis 80& 5
Coes' pattern, wrought........dis 80@80&5

Wringers. Per doz.

No. 2½ Universal........$27 00
No 2 Universal........30 00
Novelty for Common Tubs, No. 2, 10-inch...$27.00
Novelty, for Common Tubs, No. 3, 11-inch... 31.50
Excelsior, with Folding Bench, No. A, 10-in. 45.00
Excelsior, with Folding Bench, No. B, 11-in. 49.50
Peerless No. 2½........27.00
Peerless No. 3½........31 50
dis 5@10 ℔ cent

TINNERS' STOCK.

Tin.

Banca........per lb. 23@23½
Straits........" 22½@23
English........" 22½@23
Bar........23½@24

Spelter.

American, cash. ℔ lb........4⅝@5c
Bergenport........9c

Charcoal Tin Plate.

IC 12x12 225 sheets........$5 25@7 50
IX 14x20 112 sheets........6 25@9 25
DC 12½x17 100 sheets........5 00@5 50
DX 12½x17........6 25@7 00
IC 10x14 225 sheets........℔ box 5 00@7 50
IC 20x28 112 sheets........10 25@15 25
IX 10x14 225 sheets........6 25@9 25
IX 12x12 225 sheets........6 25@9 50
For each additional X add $1 25@$2 00.

Coke Tin Plate.

	Best	Ordinary
IC 10x14 } IC 14x20 }	$4 55	$4 60@—
IC 12x12	4 87½	4 75@—
IC 10x10 (Gutters 225 sheets)	8 00	7.25@—
IC 20x28 (112 sheets)		10 25

Solder.

Half and Half, in bars warranted........14¼@14½
No. I, Refined........11½@12

Zinc.

Zinc, cask........5 50@5 70
Zinc, open........6¼@6¾

LEAD.

Pig........5@5⅜c
Bar. ℔ lb........5½@5⅝c
Pipe. ℔ lb........6¾c, discount 20 per cent
Sheet. ℔ lb........7¾c, discount 20 per cent
Tin-lined pipe........15c, discount 20 per cent
Block........40c
Chilled Shot ℔ bag 25 lbs........1 70

Babbit Metal.

N P U........℔lb 6½@7c
X........10c
XX........15c
JB........20c

COPPER.

Lake Ingot........12@12¼
Baltimore........10⅝@10¾
Arizona........10¾@11c

IRON AND STEEL.

Flat Bar.

1⅛ to 4 by ⅜ to 1 inch........1 65
4¼ to 6 by ⅜ to 1 inch........1 75
1¾ to 6 by 1⅛ to 1 inch........2 05
1¼ &1⅜ by ⅜ to ¾........1 75
1 &1⅛ by ⅜ to ¾........1 80
⅝, ¾ and ⅞ by ⅜ to ⅝........2 50

Round and Square.

1 to 1⅞ inch........1 65
2 to 2⅝........1 85
2¾ to 3¼ inches........2 51
3⅜ to 4........2 65
4¼ to 4½........3 15
4¾ to 5........3 35

Oval.

⅞ to 1¼ inch........2 05
⅝ to ¾........2 52
½........2 54
⅜........2 85

Heavy Band.

1⅛ to 6 by ¼ and 5-16 inch........199
1 to 1⅜ by ¼ and 5-16 inch........191
¾ to ⅞ by ¼ and 5-16 inch........296
⅜ to ½ by ¼ and 5-16 inch........298

Halt Oval and Half Round.

1¼ to 3 inch........2 75
⅞ to 1⅛........2 35
⅝ to ¾........2 85
½........3 15
⅜........4 65

Light Band.

1½ to 6 by ⅛ to 3-16........2 15

Hoops.

1½ to 4, Nos. 13 to 15........2 45
1¼ to 2, Nos. 16 to 18........2 55
1 and 1⅛, Nos. 13 to 15........4 05

Sheet Iron.

No. 22 to 24........2 80
No. 25 to 26........3 00
No. 27........3 20
No. 28........3 40

Steel.

Best Quality Refined Cast Steel—Square, Flat Octagon and Round. Cents.

⅝ to 2 inches, inclusive........9
1-16 and 2⅛ to 3 inches........10
¼ and 3⅛ to 4 inches........11
7-32 and 4⅛ to 5 inches........12
3-16 and 5⅛ to 6 "........14½
5-32 "........18½
⅛ "........25½
Oil well steel forgings........18½

Machinery Steel.

	Crucible.	Bessemer & open-h'rth.
Ordinary sizes, ⅝ to 2 in. round	4	3
5-16 and 2⅛ to 3 in.	5	4
¼ and 3⅛ to 6 in.	6	5
7-32 in.	7	6
3-16 in.	9	8

Square, Flat and Octagon, ½c. extra throughout list.
Cut to specified lengths, ½c. extra.

Hammer Cast Steel. Cts. ℔ lb.

Crucible cast steel........5
Open-hearth steel........4

Sheet Steel.

	Crucible Best.	2d. Qual.	3d. Qual.	Bessemer & open-h'rth.
To 21 gauge,	9c.	8c.	6c.	5

1c. extra for each additional gauge. Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.

Augur and augur bit........3
Axle steel for wagons........3
Frog points and plates........5½
Frog size bars........5
Pick, hammered........5
Skate Steel........4½
Mattock, beveled........3
Table cutlery........3½
Table Cutlery, beveled........4
Trap spring steel........6
Pike and cant hook........7
Coal and granite wedge........7
Roller........5½
Spindle, subject to machinery classification. 5½
Trap spring steel........6
Forged crank pins and lathe spindles........7½
Piston rods, plain........4
Piston rods, forged to shapes........7½
Slide bars, plain........5
Slide bars, forged to shapes........7½

Open Hearth or Bessemer.

Boiler fire-box and flue sheets not less than 3-16 thick........4c
Boiler, fire-box and flue sheets not less than ⅛ thick........5c
Circulars and semi-circulars, when ordered separately........6c
Smoke stack, to shape........5c
Locomotive tank steel........4c

File Cast Steel.

Square, round, half round and flat bastard, 8-inch and over........
Mill saw, 8-inch and over........5c
Taper, 3½-inch and over........6c
Horse and shoe rasp........5c

Spring Cast Steel.........4c

Spiral, taper, cut to lengths........5½c

Tire Cast Steel.

1x¼ and over........6½c
1x3-16 ⅞x3-16 and ¼........7c
1 and 13-16x⅛ and 5-32, ¾x3-16 and 5-32........9c
¾ and ⅝x⅛ and 3-32 and 12g........10c
Solid safe cast steel........4c
Three and five ply cast steel........5c

Agricultural Implement Cast Steel.

Fork and rake, crucible........4½
Horse rake steel, cut to lengths, crucible........5
Hoe, crucible........5
Corn stalk cutter, beveled........4½
Beveled hoe and shovel steel, in bars........4½
Crucible plow steel, in slabs........4½

Bessemer and Open-hearth.

Spring........3 c
Spring spiral and taper, cut to lengths........3½
Tire, 2-16 thick and above........2½c
Toe calk........3 c
Plow........2½c
Axle billets........2 c
Sleigh shoes........2½c
Cutter shoe, cut to length and tapered........3c
Scythe back steel........3½c
Grain drill bars........2½c
Grain drill points........3½c
Rolling coulter blanks, cut and punched........6c
Thresher Teeth........3½
Rolled hammer billets........2½c
Thresher steel........2½c

Terms.—Four months 3 per cent. discount for cash, if remitted within 30 days.

Railroad Castings.

Furnace floor and straightening plates........1¼c
Housings and castings not otherwise specified 1¾c
Guide plates........2½c
Spindles and coupling boxes........1¾c
Sand rolls and pinions, large size........2 c
Sand rolls and pinions, small size........2½c
Pipe mill castings........3 c
Rolling mill castings under 50lb........2 c
Spur and bevel wheels, large........3 c
Spur and bevel wheels, small........3½c
Pulleys up to 30 inches........4 c
Pulleys over 30 inches........3½c
Engine castings, light........3½c
Engine castings, heavy........2¾c

English Steel.

Best cast........℔ lb 15c
Extra cast........16½@17c
Round machinery........10c
Circular Saw Plates........14c
Swaged, cast........16c
Best double shear........15c
Blister, 1st quality........14c
German steel, best........10c
2d quality........9c
3rd quality........8c
best cast steel, 1st quality........15½c

Boiler Rivets.—"Albany."

½, ⅝, 11-16 and ¾ inches diameter........4 00
"Standard" ½, ⅝, 11-16 and ¾ inch diam........4 00

Plumbers,' Steam and Gas Fitters' Supplies.

Grey Iron Fittings........discount 70
Steam Brass Goods........discount 65
Water Brass Goods........discount 60
Galvin Gate Valves........discount 40
Register Gauge Cocks........net 50
Steam Gauges........discount 40
Steam Gauges 5 inches net dial per doz 24 00
Scotch Glass Tubes........discount 75
Tools........Special
Soil Pipe & Fittings, Mott's List........discount 50
Sinks, Mott's list........discount 35

PIPE, WROUGHT.

Standard Wrought Iron Lap Welded Steam and Gas Pipe.

	Inside Diameter. Inches.	Weight Per Foot.	Price Per Foot Black.	Price Per Foot Galvan'd	Thickness Inches.
Butt-Welded.	⅛...	24	0 03½		.068
	¼...	42	0 03½	0 05	.088
	⅜...	56	0 03½	0 05½	.091
	½...	84	0 04½	0 06	.109
	¾...	1 12	0 06	0 08	.113
	1 ...	1 67	0 08	0 10½	.134
	1¼...	2 24	0 11	0 14	.140
Lap Welded.	1½...	2 68	0 21	0 24	.145
	2 ...	3 61	0 26	0 30	.154
	2½...	5 74	0 42	0 47	.204
	3 ...	7 54	0 55	0 62	.217
	3½...	9 00	0 67	0 83	.226
	4 ...	10 66	0 83	1 00	.237
	4½...	12 24	1 00	1 25	.246
	5 ...	14 50	1 20	1 50	.259
	6 ...	18 76	1 50	2 00	.280
	7 ...	23 27	2 00		.301
	8 ...	28 18	2 75		.322
	9 ...	33 70	3 70		.344
	10 ...	40 06	4 75		.366
	11 ...	45 02	5 75		.375
	12 ...	49 00	6 50		.375
	13 ...	54 00	7 75		.375
	14 ...	58 00	9 00		.375
	15 ...	......	10 00		.375

Discount, (car load lots) butt-welded ⅛ inches to 1¼ inches plain........45 per cent
Ditto galvanized........35 per cent
Discounts (car load lots) lap-welded 1½ inches to 15 inches plain........62½ per cent
Ditto galvanized........45 per cent
Discounts on less than car lots 2½ per cent. less.
Discounts on pipe cut to specified lengths depends on size and waste, ordinarily 5 per cent lower than random.

Boiler Tubes.

Discount........55 per cent

SCRAP IRON AND OLD METAL

Per Ton.

No. 1 R. R. wrought scrap........$19 00
No. 1 wrought scrap........17 00
No. 1 Machine cast scrap........12 75
Stove plate (free from burnt iron)........9 75
Grate bars........8 25
Pipes and flues (Clean)........11 50
Tank iron........12 25
Hoop and band iron........8 50
Light sheet iron........9 50
Axle turnings........13 50
Wrought turning (free from cast)........12 00
Wrought iron, oily drillings........11 00
Cast borings........9 50
Malleable iron........9 25
Uncut wrought iron boilers........12 50
Old copper per lb........9½
No. 1. H. Brass per lb........9
Heavy yellow brass do........7½
Light Brass per lb........6½
Scrap Zinc per lb........3½
Tea Lead per lb........3½
Heavy Lead per lb........3
Rails........steel $22 00, iron $22 00
Car wheels........16 25

COAL.

WHOLESALE.

Wholesale f. o. b. cars at Cleveland:

Carbon Hill and Monday Creek........$2 10@2 25
Massillon........2 50@2 65
Palmyra, lump........2 75@2 90
Brier Hill........2 75@3 00
Pittsburgh........2 25@2 50
Salineville........2 00@2 25
Tuscarawas........2 00@2 25
New Hazelton........2 00
New Hazelton, mix........1 15@1 20
" " nut........1 75@1 85
Connotton........2 00@2 25
Connotton, mix........1 20
" nut........1 75@1 85
Anthracite grate........4 37
Anthracite egg........4 46
Anthracite stove........4 87
Anthracite chestnut........4 69

RETAIL.—Delivered.

Massillon Lump........3 65
" Nut........3 40
Carbon Hill and Monday Creek, lump........3 50
Carbon Hill and Monday Creek, nut........3 25
Straitsville, lump........3 40
Straitsville, nut........3 15
Palmyra Lump........3 75@4 00
New Hazelton Lump........2 75
New Hazelton Nut........2 50
Osnaburg Lump........2 75
Osnaburg Nut........2 50
75c less on cars by car load.
Anthracite Stove and Chestnut........5 75
Egg and grate........5 50

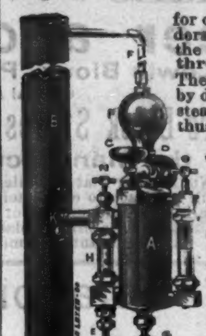
OILS.

Pure Oils. Packages included.

Sperm. winter bleached per gal........1 15@1 20
Whale, winter bleached per gal........60@65
Straits........37@40
Bank........35@38
Lard oil, extra W. S........53@58
do No. 1 do........45@48
do No. 2 do........40@45
Tallow oil........60@65
Neatsfoot oil, pure........90@$1 00
do No. 1........65@75
Linseed oil, raw........46@49
do do boiled........49@52
Cotton seed oil, white........47@50
do do yellow........48@53
West Virginia lubricating 28 deg........10c@15c
Paraffine oil, winter pressed........15@18
Capitol Cylinder........55
Model do........30
Eldorado Engine........23
Turpentine, per gal........38
Leader Cylinder........70

DETROIT LUBRICATOR CO.'S

Sight Feed Lubricator Cups,



for oiling valves and cylinders of steam engines, by the only perfect method, through the steam pipe. The oil passes in sight, drop by drop, into the column of steam, where it vaporizes, thus becoming a steam lubricant, oiling perfectly every part reached by the steam. Saves from 50 to 90 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on 20 days' trial, if desired. In ordering, give diameter of cylinder. We refer to more than 10,000 firms using them.

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	9 40		..... Buffalo	5 45		
	12 50p.m		........Erie, ...	2 33		a.m
	2 43		...Ashtabula...	12 44		9 47
	3 43		.. Painesville ..	11 55		7 40
	3 56		..Willoughby ..	11 33		7 00
	4 46		arCleveland lv	10 45		5 45
a.m					p.m	p.m
5 50	4 51	6 45 lv	" ar	10 40	9 00	4 40
8 20	6 06	7 53	..... Lorain......	9 31	7 56	2 40
9 12	6 30	8 15	.. Vermillion ..	9 11	7 34	2 00
						p.m
11 00	7 35	9 10	.....Bellevue ...	8 00	6 25	12 01
	8 05	9 45	Green Springs	7 35	5 54	
				a.m		
	8 50	10 25	.....Fostoria.....	6 50	5 00	
		10 37	.....Arcadia		4 49	
		11 32	..... Leipsic......		3 57	
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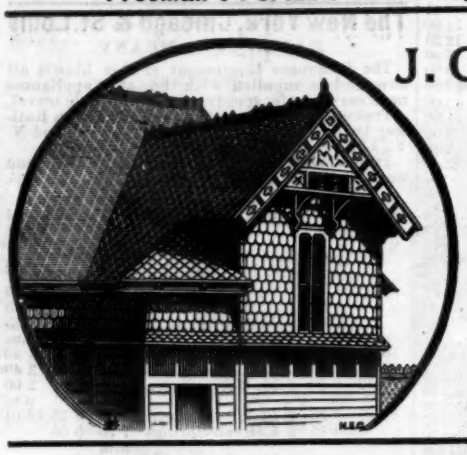

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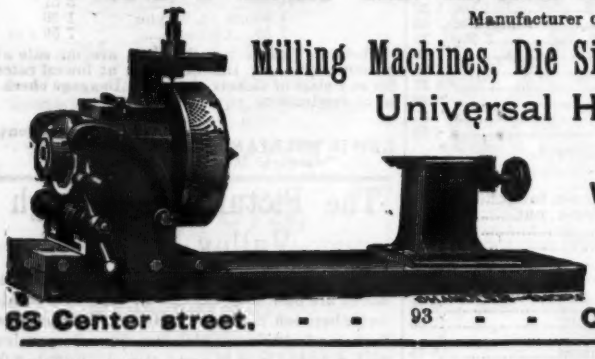

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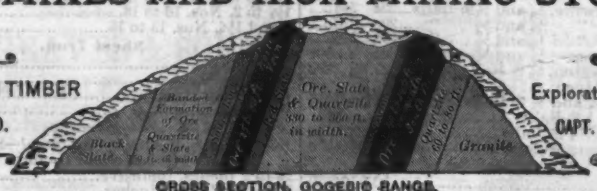

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Explorations made by CAPT. N. D. MOORE.

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TRUE TO PATTERN, sound, solid, free from blow-holes, and of unequalled strength. Stronger and more durable than iron forgings in any position, or for any service whatever. 40,000 Crank Shafts and 30,000 Gear Wheels of this steel now running prove this. Cross-Heads, Rockers, Piston Heads, etc., for Locomotives. STEEL CASTINGS of every description. Send for Circulars and prices to

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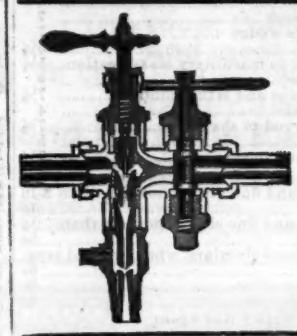

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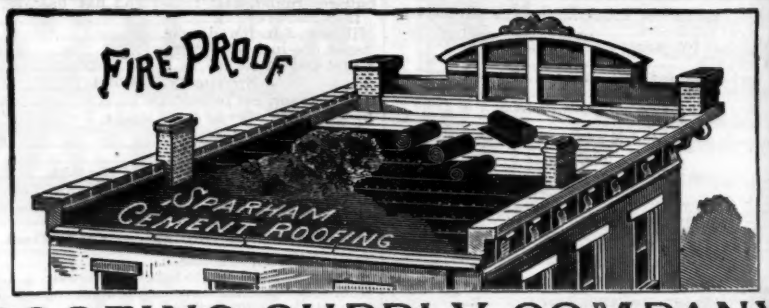

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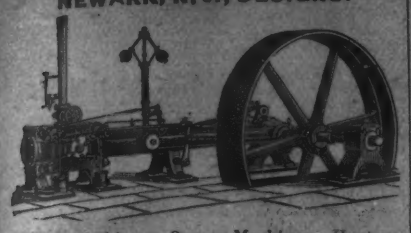

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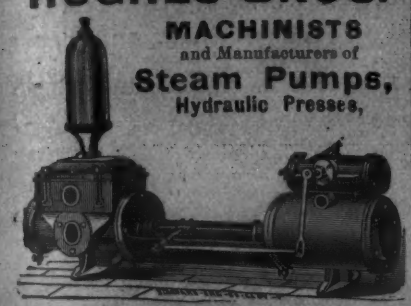

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Giving lights of 1,200, 2,000, 3,000, 4,000 and up to 100,000 candle-power. Our No. 8 Machine gives 65 lights of 2,000 candle-power with about 45 horse-power.
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Machines for Incandescent Lighting,

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Our carbons are the purest and best made. We have the largest and most fully equipped carbon factory in the world, and our prices are very low.

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We have commenced the manufacture of the Brush Electric Motors, and shall soon be prepared to fill orders for all sizes, from one up to forty horse-power. In many locations these are the most economical producers of power, and will be largely used by Lighting Companies and others where small powers are required.
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AT NILES BOILER WORKS.

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Cincinnati Steam Heating Co.
Will equip all kinds of Manufacturing Establishments with the
GRINNELL
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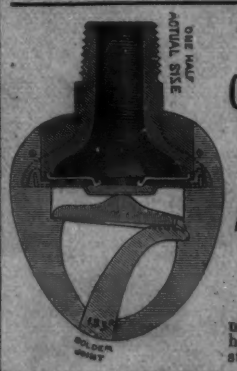

By this system a fire is extinguished automatically—that is, by the action of its own heat—in about one minute from the time it starts to burn.

A fire alarm is given at the instant the Sprinkler works. Perfect protection against frost, at any temperature, is secured. An abundant supply of water under great pressure is provided where no adequate city supply exists.

The GRINNELL is the only Sprinkler that has withstood the test of Years.
EACH SPRINKLER IS TESTED TO 1,000 POUNDS PRESSURE.
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Address **The Cincinnati Steam Heating Co.,**
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SAFETY WINDOW SASH LOCKS.

Patented Aug. 7, 1883, and Aug. 25, 1885.

These Locks have all advantages which are desirable in a Window Sash Lock. They render the window sash adjustable at any point; they lock the sash firmly there; they prevent the sash from rattling; they take the place of a weather strip; they are cheap, simple, durable, can be used on old and new windows, with or without weights; they are rapidly gaining the public favor, wherever introduced. Circulars and price-list free. Sample lock by mail, 10 cents. Address CHAMPION SAFETY LOCK & NOVELTY CO. 104 Canal St., Cleveland, O.

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Cost no more than ordinary locks. Turning the thumb-knob closes key-hole and fastens both knob and latch, and no key can be inserted from the outside.
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J. V. KENNEDY, Prop.,
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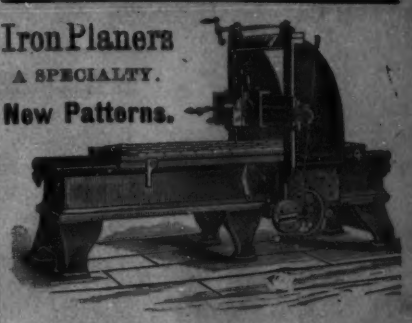
Iron Planers
A SPECIALTY.
New Patterns.



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Sizes from 20 in. by 20 in. and 30 in. by 30 in. to plane from 4 to 10 feet in length.
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Manufacturers of
Coopers' Tools,
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KNIVES
for
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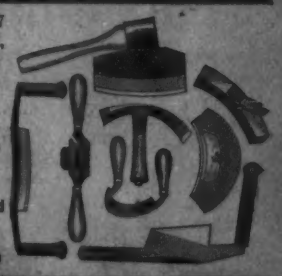

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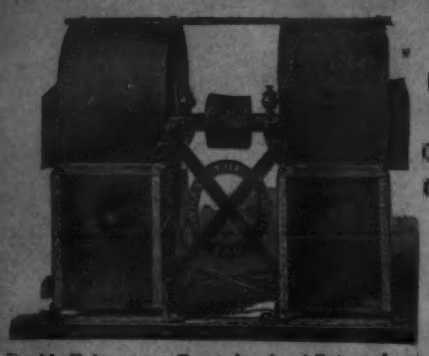
SAVE 50 per cent. Power

Most Compact, Cheapest.



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LIGHT MANUFACTURING.

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MINERAL WOOL.

(Protected by U. S. Patents.)

AN INDESTRUCTIBLE MATERIAL.

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FREEDOM FROM RATS, MICE AND INSECTS. DEADENING OF SOUND.

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Roofing Materials, Roof Cements, Coatings, etc.

Strongest Roofing Made.

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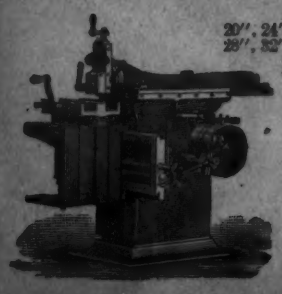
28", 32" Back Geared and Power Feed Drills.

SEND FOR PRICES. } It will pay you.



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Manufacturers of

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Orders Solicited for

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Send Drawings and Specifications.

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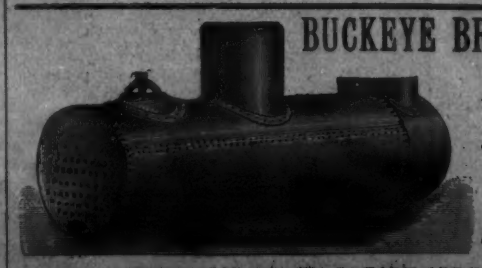

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